

PROJECT DESCRIPTION

ONE (1) AIR COMPRESSOR PACKAGE
 FOR: HUSKY OIL OPERATIONS LTD.
 LOCATION NAME: MCMULLEN THERMAL CONDUCTION PILOT (TCP) PROJECT
 LSD: 03-35-078-25 W4M

FABRICATED BY:

ENERFLEX LTD.
 CALGARY, ALBERTA, CANADA

TANK CAPACITIES

GLYCOL STORAGE TANK: 330 LITERS
 WASTE OIL STORAGE TANK: 330 LITERS
 CYLINDER LUBE OIL DAYTANK: 300 LITERS
 COMPR./ENGINE LUBE OIL DAYTANK: 300 LITERS

EQUIPMENT LIST (EACH EQUIPMENT NUMBER IS PRECEDED WITH A FUNCTIONAL LOCATION CODE.)

TAG NO.	DESCRIPTION	P&ID
V-0601	STAGE 1 SUCTION SCRUBBER	31967-111 SHT. 1
V-0602	STAGE 1 SUCTION BOTTLE	31967-111 SHT. 1
V-0603	STAGE 1 DISCHARGE BOTTLE	31967-111 SHT. 1
V-0604	STAGE 2 SUCTION SCRUBBER	31967-111 SHT. 2
V-0605	STAGE 2 SUCTION BOTTLE	31967-111 SHT. 2
V-0606	STAGE 2 DISCHARGE BOTTLE	31967-111 SHT. 2
CYL-0601	STAGE 1 COMPRESSION CYLINDER	31967-111 SHT. 1
CYL-0602	STAGE 2 COMPRESSION CYLINDER	31967-111 SHT. 2
IC1	STAGE 1 COOLER SECTION	31967-111 SHT. 1
AC	STAGE 2 COOLER SECTION	31967-111 SHT. 2
CE-0601	ENGINE	31967-112 SHT. 1
K-0600	RECIPROCATING GAS COMPRESSOR FRAME	31967-112 SHT. 1
CP-0601	CONTROL PANEL	31967-112 SHT. 1
E-0600	COOLER FRAME	31967-112 SHT. 1
E-0601	COMPRESSOR FRAME OIL COOLER	31967-113 SHT. 1
FR-0600	COMPRESSOR FRAME OIL FILTER	31967-113 SHT. 1
P-0600	COMPRESSOR LUBE OIL PUMP	31967-113 SHT. 1
P-0601	COMPRESSOR FRAME OIL PUMP	31967-113 SHT. 1
T-0600	LUBE OIL DAYTANK	31967-113 SHT. 1
T-0601	WASTE OIL TANK	31967-113 SHT. 1
T-0602	COMPRESSOR/ENGINE OIL DAYTANK	31967-114 SHT. 1
T-0603	WASTE GLYCOL TANK	31967-116 SHT. 1
T-0604	GLYCOL (EJW) SURGE TANK	31967-116 SHT. 1
T-0605	GLYCOL (AJW) SURGE TANK	31967-116 SHT. 2
P-0602	EJW PUMP	31967-116 SHT. 1
P-0603	AJW PUMP	31967-116 SHT. 1
EJW	EJW COOLER	31967-116 SHT. 1
AJW	AJW COOLER	31967-116 SHT. 2
FR-0601	AIR FILTER HOUSING	31967-117 SHT. 1

POWER REQUIREMENTS

ENGINE IGNITION SYSTEM: VOL: 24 VDC
 CONTROL PANEL: VOL: 24 VDC
 FIRE DETECTION: VOL: 24 VDC
 LEL DETECTION: VOL: 24 VDC
 LIGHTS: VOL: 120 VAC
 BUILDING HEATERS: VOL: 120 VAC
 BUILDING FANS: VOL: 115 VAC
 IMMERSION HEATERS: VOL: 120 VAC

SYSTEM CONSUMABLES

COMPRESSOR CRANKCASE LUBE OIL: ESSO GMA40, LOW ASH, 22.7 LITERS
 COMPRESSOR CYLINDER LUBE OIL: ISO 100 SYNTHETIC, LOW ASH
 ENGINE CRANKCASE LUBE OIL: ESSO GMA40, LOW ASH, 166.6 LITERS
 NORKOOL, 50% ETHYLENE INHIBITED GLYCOL/WATER SOLUTION
 IN ENGINE & AUXILIARY JACKED WATER SYSTEMS
 AJW & EJW CAPACITY: 350 LITERS

DESIGN SPECIFICATION:

ENERFLEX LTD. (EFX) SCOPE OF SUPPLY ON THIS PROJECT CONSISTS OF ONE SKIDDED GAS COMPRESSOR PACKAGE.

PACKAGE CONSISTS OF ONE (1) WAUKESHA F18GL ENGINE DRIVING AN ARIEL JGJ/2, ONE/TWO STAGE, AIR COMPRESSOR.

PRIMER: -TPS-SP-001, FIN-1, RED OXIDE
 PAINT: -TPS-SP-001, FIN-1, 20-F "WARM GREY"
 PROCESS PIPING: -10% RADIOGRAPHIC TESTING

-10% MT ON FILLET WELDS
 -1/16" CORROSION ALLOWANCE
 -NO PWHT
 -SSPC-SP3
 -SPOOLING BETWEEN CONE STRAINER AND COMPRESSOR SUCTION FLANGE SANDBLASTED INTERNALLY SSPC-SP6
 -NO PICKLING
 -NDE INTERPRETATION TO BE CGSB
 -MTR'S REQUIRED
 -5% RADIOGRAPHIC TESTING
 -10% MT ON FILLET WELDS
 -NO PWHT
 -SSPC-SP3
 -SUCTION VESSELS BETWEEN CONE STRAINER AND COMPRESSOR SUCTION FLANGE SANDBLASTED INTERNALLY SSPC-SP6
 -NO PICKLING
 -NDE INTERPRETATION TO BE CGSB
 -MTR'S REQUIRED

VESSELS:

DESIGN CRITERIA & APPLICABLE CODES

SITE ELEVATION: 1886 FT ABOVE MEAN SEA LEVEL
 BAROMETRIC PRESSURE: 94.518 KPAA
 AMBIENT TEMPERATURE: MAXIMUM 37.8°C
 MINIMUM -45°C
 WIND SPEED: MAXIMUM 160 km/hr
 PROCESS INLET: DESIGN 4447.1 KPAG @ 149°C
 PROCESS FINAL DISCHARGE: DESIGN 8756.3 KPAG @ 177°C
 INSTRUMENT GAS: MINIMUM PRESSURE 344.7 KPAG
 MAXIMUM PRESSURE 1034.2 KPAG
 QUALITY FILTERED/DRY, 50°F MAXIMUM DEW POINT
 APPLICABLE CODE: CODE PIPING B31.3 - LATEST EDITION
 NON-CODE PIPING EFX C01, 1mm CA
 VESSEL ASME SECTION VIII
 EXCHANGER ASME SECTION VIII
 STRUCTURAL AWS D1.1
 ELECTRICAL CEC
 REGISTRATION: VESSEL AB, BC, SASK
 MISCELLANEOUS: GASKETS CG TYPE, SPIRAL WOUND, CHLOROCARB FILLED, 316SS
 PROCESS PIPE CARBON STEEL
 UTILITY PIPE CARBON STEEL
 FLANGES RAISED FACE (UNLESS OTHERWISE NOTED)
 ORIFICE PLATES PER ACOUSTICAL STUDY
 THREAD SEALANT JETLUBE ONLY (SWAK NOT PERMITTED)
 TUBING & FITTINGS: (SPE-010-TUB)
 TUBING - 316(SS) SMLS, 3/8" MIN Ø
 FITTINGS - 316(SS)
 FERRULES - 316(SS)
 UTILITY TUBING - 304(SS) SMLS
 FITTINGS - ZINC PLATED CS
 FERRULES - 316(SS) BACK / CS FRONT
 FRAME INTERNALS TUBING - 316(SS) SMLS
 FITTINGS - ZINC PLATED (SS FERRULES)
 RIGID ALUMINUM CONDUIT
 CLASS 1, DIV 2, GROUP D

ELECTRICAL:
 SUITABLE FOR USE IN:



F:\30000 Projects\30_31900-31999\31967 Husky Oil - McMullen TCP - F18C JGJ/2.4. Drafting\PK01\31967-111_Rev2.dwg PLOT DATE Sep 19, 2012, 5:02 PM

DATE 04/12/12		SCALE NTS		HUSKY OIL OPERATIONS LTD. WAUKESHA F18GL ARIEL JGJ/2-1/2 STD	ENERFLEX Calgary, Alberta, Canada	P & I DIAGRAM PROJECT DESCRIPTION & OVERVIEW
2	AS BUILT	09/17/12	SE AZ			
1	REVISED TO CUSTOMER MARK UPS	05/16/12	JMS A.D.			
0	ISSUED FOR CONSTRUCTION	05/02/12	JMS JL			
A	ISSUED FOR CHECKING	04/16/12	JMS JL			
REV	DESCRIPTION	DATE	BY	APR	APECCA PERMIT No: P8651	STEP CODE -
					WORK ORDER 31967	DWG NO 31967-099
						SHT 1
						REV 1

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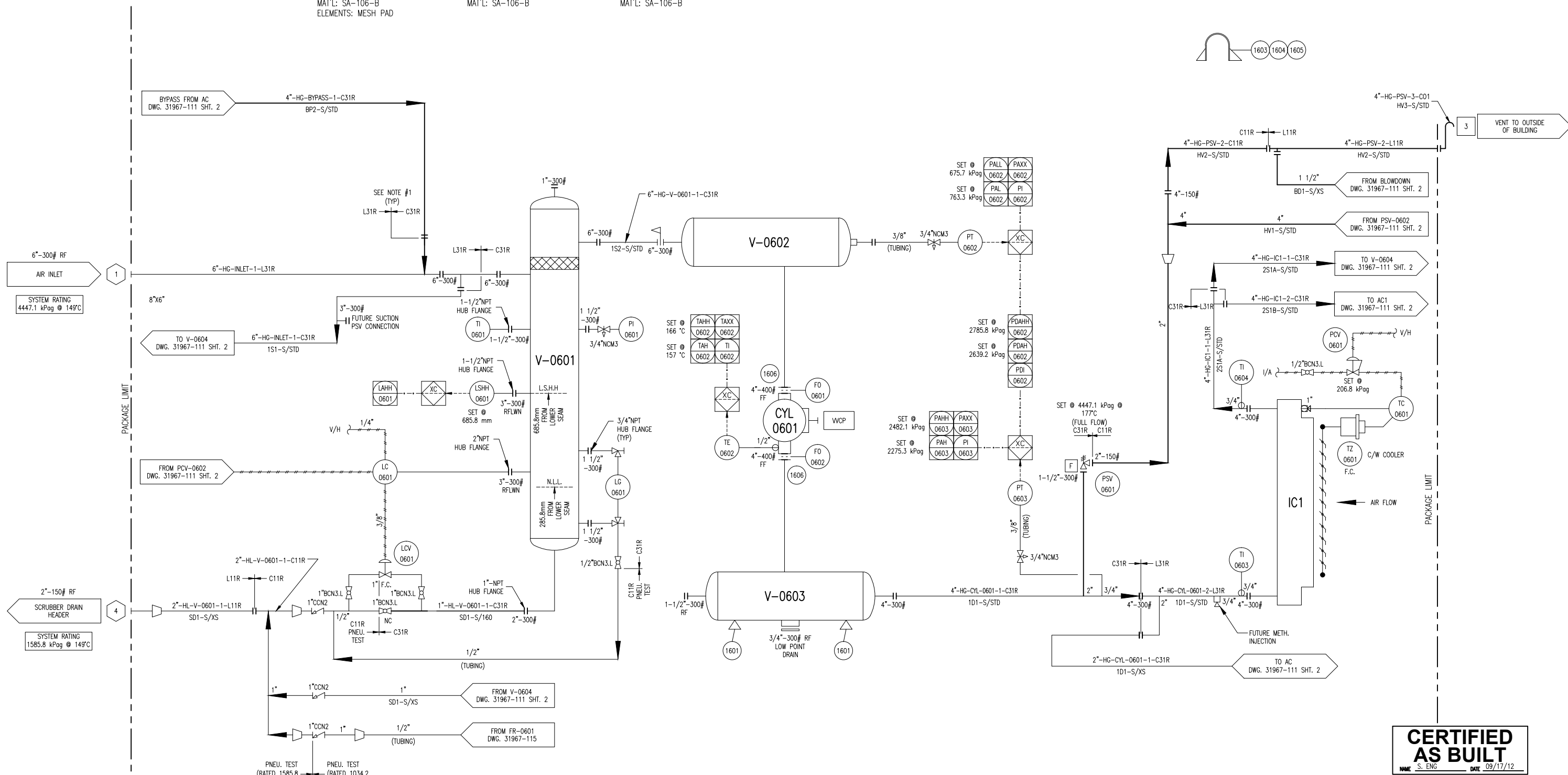
V-0601
1ST STAGE
SUCTION SCRUBBER
MFG: EFX
SIZE: 24" OD X 66" S/S
MAWP: 4516.1 kPag @ 149°C
MDMT: -29°C @ 4516.1 kPag
CA: 1/16"
MAT'L: SA-106-B
ELEMENTS: MESH PAD

V-0602
1ST STAGE
SUCTION BOTTLE
MFG: EFX
SIZE: 12 3/4" OD X 20" S/S
MAWP: 4516.1 kPag @ 149°C
MDMT: -29°C @ 4516.1 kPag
CA: 1/16"
MAT'L: SA-106-B

V-0603
1ST STAGE
DISCHARGE BOTTLE
MFG: EFX
SIZE: 12 3/4" OD X 36" S/S
MAWP: 4447.1 kPag @ 177°C
MDMT: -29°C @ 4447.1 kPag
CA: 1/16"
MAT'L: SA-106-B

CYL-0601
1ST STAGE
COMPRESSION CYLINDER
MFG: ARIEL
MODEL: 7 3/8 RJ
SIZE: 7.375" BORE
MAWP: 5826.1 kPag
THROW: #1

IC1 (E-0600)
1ST STAGE
COOLER SECTION
MAWP: 4447.1 kPag @ 177°C
MDMT: -45°C @ 4447.1 kPag
CA: 1/16"



NOTES:
1. ALL SKID EDGE AND OFF SKID PIPING TO BE LOW TEMP. PIPE AND FITTINGS UP TO FIRST FLANGE BREAK INSIDE BUILDING.

CERTIFIED AS BUILT
S. ENG. DATE 09/17/12

PLOT DATE: Sep 19, 2012, 9:58 AM; P:\30000 Projects\30_31900-31999\31967 Husky Oil - McMullen TOP - F18GL G2D 4. Drafting\31967-111_Rev2.dwg

DATE 04/12/12		SCALE NTS		HUSKY OIL OPERATIONS LTD. WAUKESHA F18GL ARIEL JGJ/2-1/2 STD	ENERFLEX Calgary, Alberta, Canada	P & I DIAGRAM PROCESS GAS STAGE #1	DWG NO 31967-111	SHT 1	REV 2
2	AS BUILT	09/17/12	SE AZ						
1	REVISED TO CUSTOMER MARK UPS	05/16/12	JMS A.D.						
0	ISSUED FOR CONSTRUCTION	05/02/12	JMS J.LIN						
A	ISSUED FOR APPROVAL	04/16/12	JMS J.L.	APEGGA PERMIT No: P8651	STEP CODE 490 511 591	WORK ORDER 31967			

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K-0600
RECIPROCATING GAS
COMPRESSOR FRAME
 MFG: ARIEL
 MODEL: JGJ/2
 RATED POWER: 620 HP @ 1800 RPM
 STROKE: 3.50 in.
 ROD LOAD, TOTAL: 42,000 lbs.
 ROD LOAD, COMPRESSION: 23,000 lbs.
 ROD LOAD, TENSION: 21,000 lbs.

KBU-0600
BUILDING EXHAUST FAN
 MFG: SOPEL
 MODEL: KL 16XP1PH
 POWER: 1/4 HP @
 1725 RPM
 115 VAC, 4.8A
 (WIRED TO JBP-0601)

CE-0601
COMPRESSOR ENGINE
 MFG: WAUKESHA
 MODEL: F18GL
 BORE: 5.98"
 STROKE: 6.5"
 DISPLACEMENT: 1096 IN CU.
 COMP RATIO: 8.7:1
 POWER: 400 BHP @ 1800 RPM

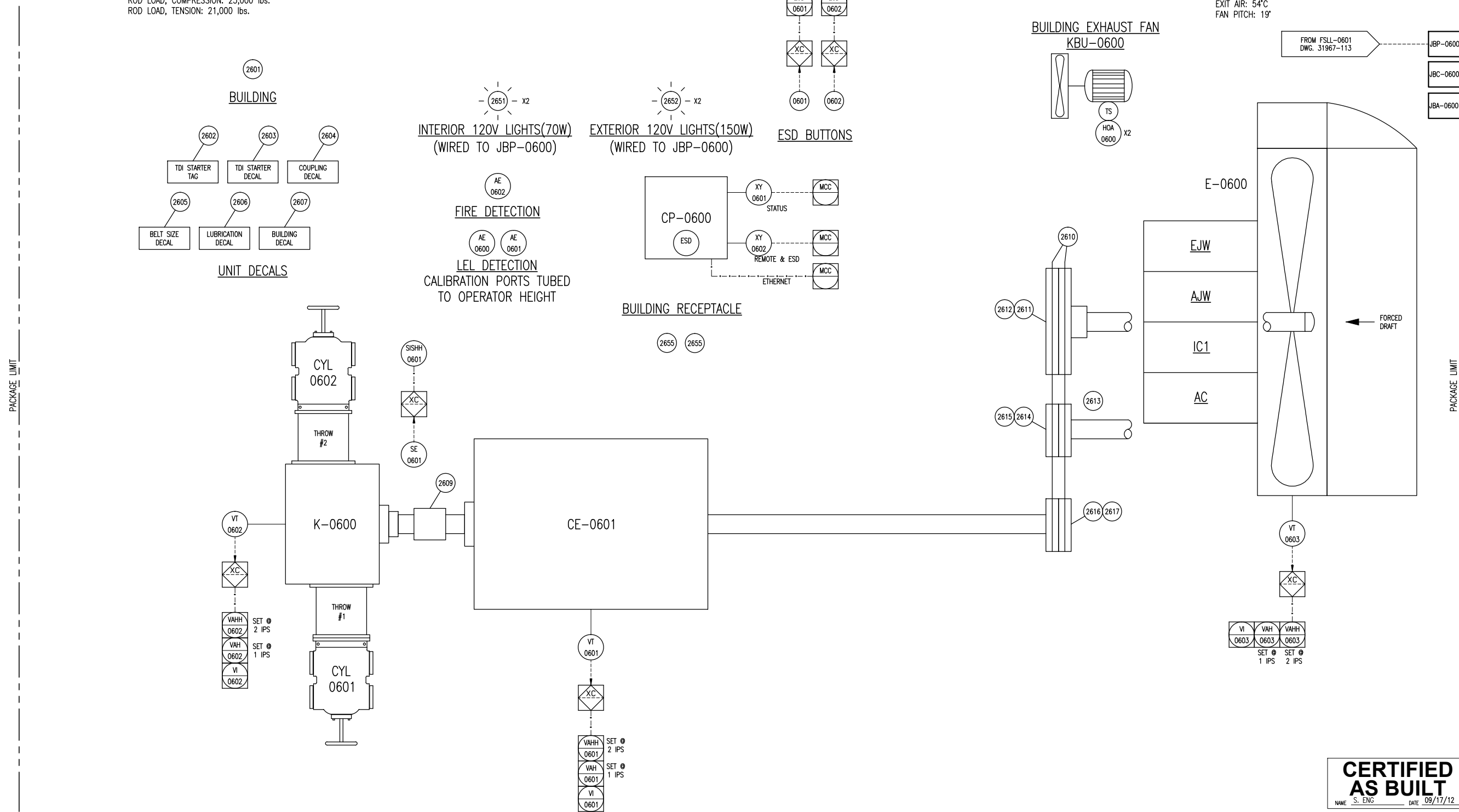
CP-0600
CONTROL PANEL
 MFG: EFX
 POWER: 24 VDC
 PROCESSOR: COMPACT LOGIX

JBP-0600
JUNCTION BOX
 MFG: EFX
 FOR: 120 VAC

JBC-0600
JUNCTION BOX
 MFG: EFX
 FOR: 24DC DISCRETE SIGNALS

JBA-0600
JUNCTION BOX
 MFG: EFX
 FOR: ANALOGS

E-0600
PACKAGE GAS COOLER FRAME
 MFG: AIR-X-LIMITED
 MODEL: 96AEF-R
 TYPE: FORCED DRAFT
 AIR FLOW: 82,740 SCFM
 FAN TYPE: 1 MOORE 96DIA. X 6 BLADES
 FAN POWER: 21.3 BHP @ 418 RPM
 AMBIENT AIR: 40°C
 EXIT AIR: 54°C
 FAN PITCH: 19'



CERTIFIED AS BUILT
 NAME: S. ENG DATE: 09/17/12

PLOT DATE: Sep 19, 2012, 5:02:58 AM
 P:\30000 Projects\30_31900-31999\31967 Husky Oil - McMullen TOP - F18GL JGJ/2 V4 - Drafting\A00\31967-111_RevZ.dwg

				DATE: 04/12/12	SCALE: NTS	HUSKY OIL OPERATIONS LTD. WAUKESHA F18GL ARIEL JGJ/2-1/2 STD	ENERFLEX Calgary, Alberta, Canada	P & I DIAGRAM		
				DRAWN BY: J.STEINKE	CHECKED BY: J.LIN			APPROVED BY: S.PRITCHARD	DRIVE TRAIN/CONTROL PANEL	
				PROJECT MANAGER: S.PRITCHARD	PROJECT ENGINEER: J.LIN					
				CUST PO						
1	AS BUILT	09/17/12	SE	AZ				DWG NO: 31967-112	SHT: 1	REV: 1
0	ISSUED FOR CONSTRUCTION	05/02/12	JMS	J.LIN						
A	ISSUED FOR APPROVAL	04/16/12	JMS	JL						
REV	DESCRIPTION	DATE	BY	APR	APEGA PERMIT No: P8651	STEP CODE: 151 198 511 712 721	WORK ORDER: 31967			

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T-0600
CYL. LUBE OIL DAYTANK
 MFG: EFX
 SIZE: 12'x8'x1/4" HSS-18' 11"L
 MAT'L: SA-36
 CAPACITY: 300L

T-0601
WASTE OIL STORAGE TANK
 MFG: EFX
 SIZE: 12'x8'x1/4" HSS-19' 11"L
 MAT'L: SA-36
 CAPACITY: 330L

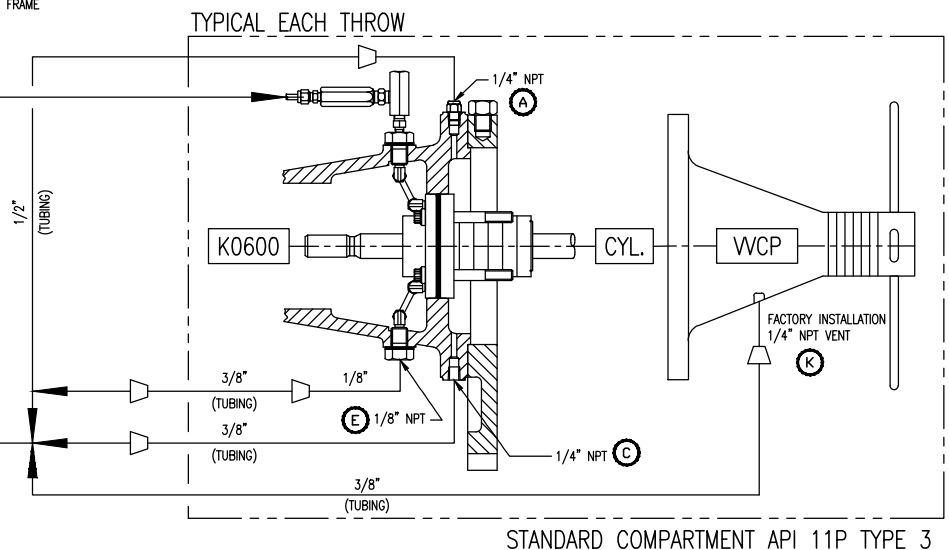
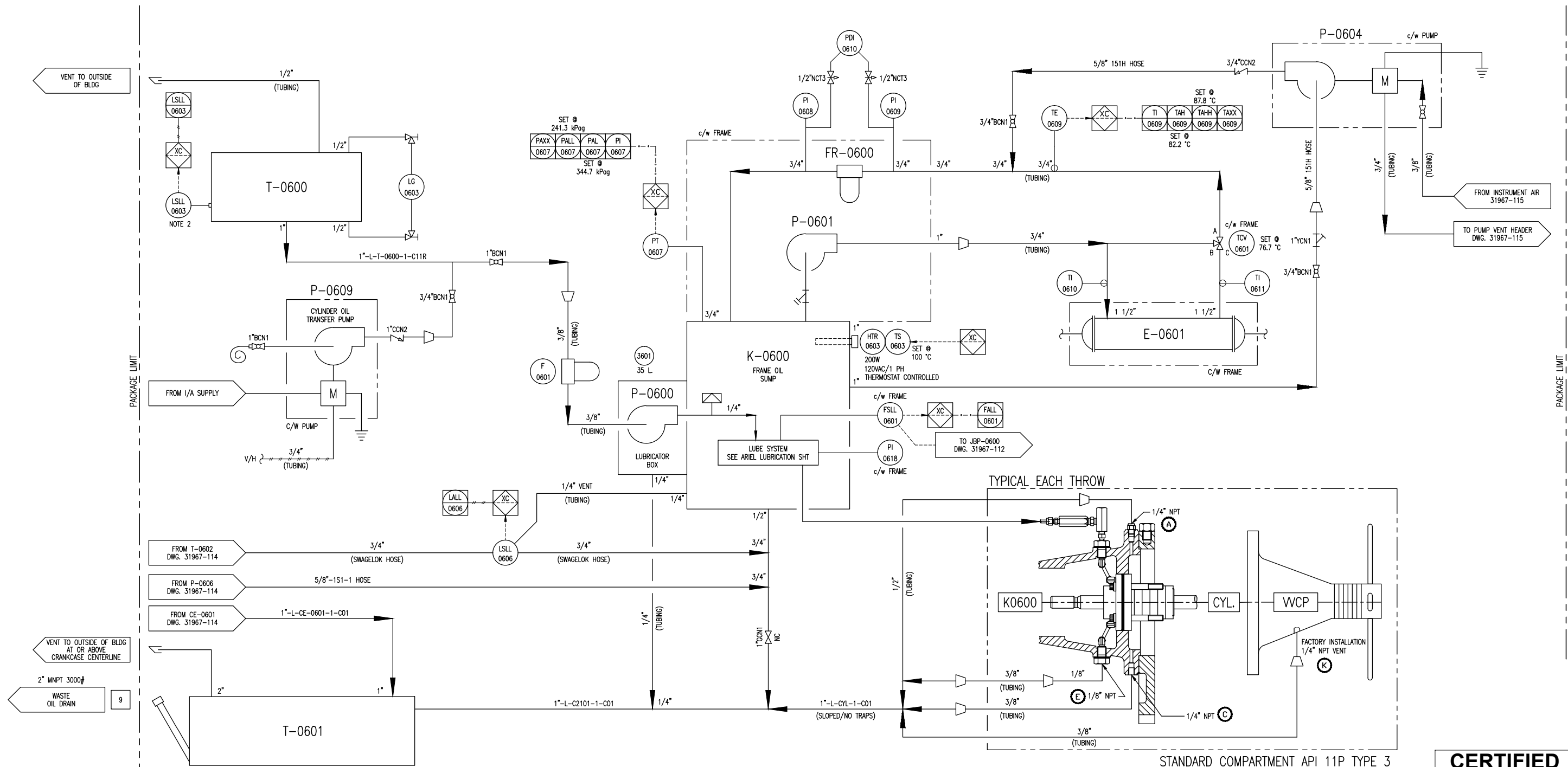
P-0600
COMPRESSOR LUBE OIL PUMP
 MFG: ARIEL
 PLUNGER PUMP
 P/N: C-0084
 DRIVE: PLUNGER

P-0601
COMPRESSOR FRAME OIL PUMP
 MFG: ARIEL
 MAX. FLOW: 10 GPM
 P/N: B-0425
 DRIVE: CHAIN

FR-0600
COMPRESSOR FRAME OIL FILTER
 MFG: ARIEL
 ELEMENT: ARIEL
 P/N: A-0061

E-0601
COMPRESSOR FRAME OIL COOLER
 MFG: ARIEL
 MODEL: B-1962
 DRAWING#: A-4154

P-0604
COMPRESSOR PRE-LUBE OIL PUMP
 MFG: YAMADA
 MODEL: NDP-20BAN
 MAX. FLOW: 28 GPM



CERTIFIED AS BUILT
 NAME: S. ENG. DATE: 09/17/12

NOTES:
 1. LETTER TAGS REFER TO DWG. #DANDV-ARIELSTD.
 2. MOUNT AS LOW AS POSSIBLE.

REV	DESCRIPTION	DATE	BY	APR	REV	DESCRIPTION	DATE	BY	APR
7	AS BUILT	09/17/12	SE	AZ	4	ADDED CYLINDER VENTS, IFC	07/27/12	AH	J.LIN
6	ADDED CYLINDER OIL TRANSFER PUMP	08/30/12	SE	AZ	3	UPDATED TAG NUMBERS	07/12/12		
5	ADDED INTERNAL, REMOVED CONTROL FROM LOW LEVEL SWITCH FROM FRAME OIL SUMP.	08/01/12	SE	J.LIN	2	REVISED PER CUSTOMER MARK UPS	06/12/12	SE	J.LIN
					1	REVISED PER CUSTOMER MARK UPS	05/16/12	SE	J.LIN
					0	ISSUED FOR CONSTRUCTION	05/02/12	JMS	J.LIN
					A	ISSUED FOR APPROVAL	04/16/12	JMS	J.L.

DATE	04/12/12	SCALE	NTS
DRAWN BY	J. STEINKE	CHECKED BY	S. PRITCHARD
PROJECT MANAGER	S. PRITCHARD	PROJECT ENGINEER	J. LIN
CUST PO			
APEGGA PERMIT No:	P8651	STEP CODE	511 591
WORK ORDER	31967		

HUSKY OIL OPERATIONS LTD. WAUKESHA F18GL ARIEL JGJ/2-1/2 STD		ENERFLEX Calgary, Alberta, Canada	P & I DIAGRAM COMPRESSOR LUBE OIL & UTILITIES
DWG NO	31967-113		
SHT	1	REV	7

P:\00000 Projects\30_31900-31999\31967 Husky Oil - McMillen TCP - F18GL JGJ/2-1/2 Drafting\2460\31967-111_Rev2.dwg
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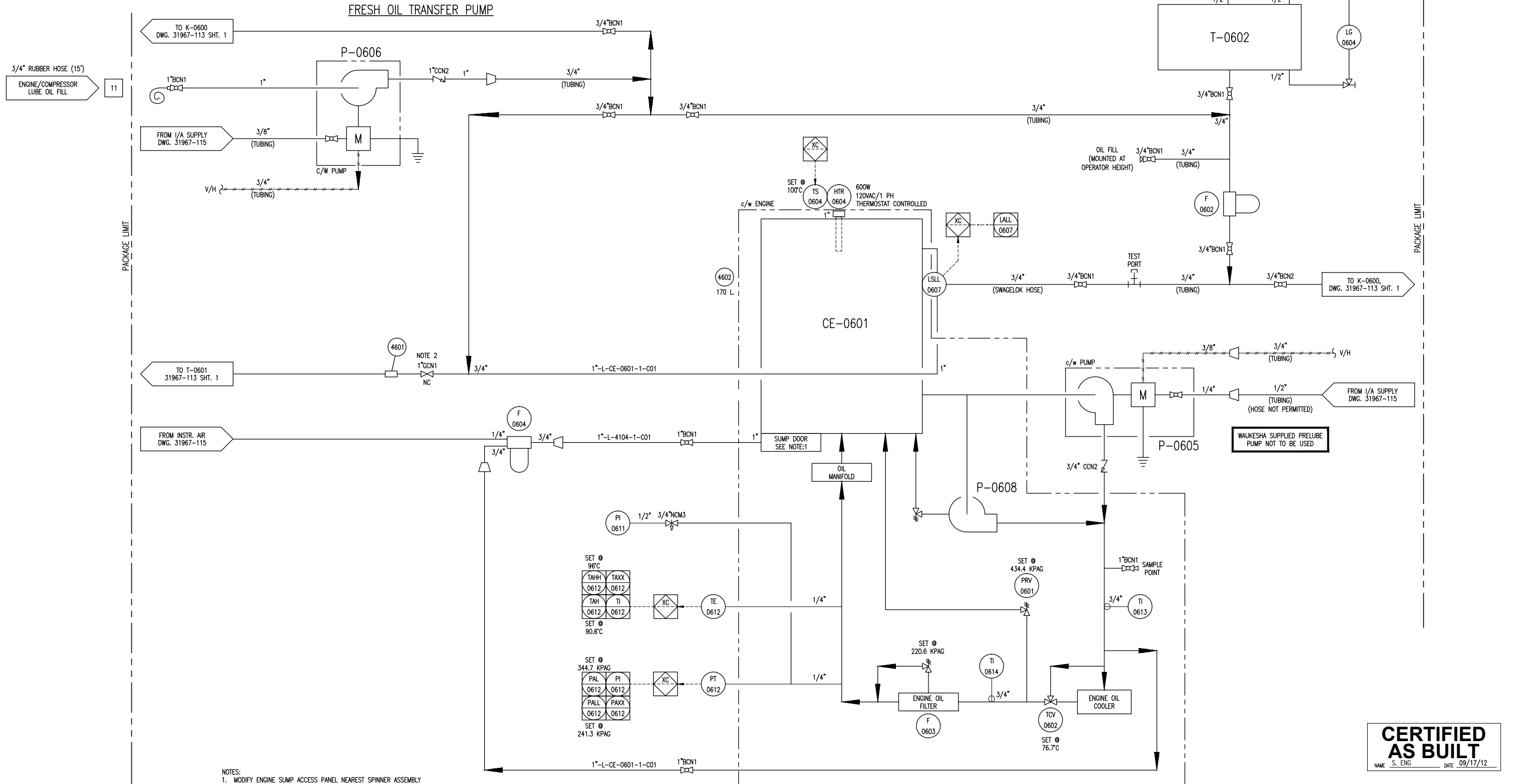
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P-0606
FRESH OIL TRANSFER PUMP
 MFG: YAMADA
 MODEL: NDP-25BAN
 GPM: 49
 DRIVE: PNEUMATIC

P-0608
ENGINE LUBE OIL PUMP
 MFG: WAUKESHA
 DRIVE: ENGINE

P-0605
ENGINE PRE-LUBE OIL PUMP
 MFG: YAMADA
 MODEL: NDP-20BAN
 GPM: 28
 DRIVE: PNEUMATIC

T-0602
COMPRESSOR/ENGINE OIL DAYTANK
 MFG: EFX
 SIZE: 12'x8'x1/4" HSS-18' 11"
 MAT'L: SA-36
 CAPACITY: 300L



- NOTES:
 1. MODIFY ENGINE SUMP ACCESS PANEL NEAREST SPINNER ASSEMBLY WITH 1"-3000# COUPLING. INSTALL ABOVE OIL LEVEL.
 2. INSTALL AWAY FROM ENGINE FRONT.

CERTIFIED AS BUILT
 NAME: S. ENG DATE: 09/17/12

REV	DESCRIPTION	DATE	BY	APR	REV	DESCRIPTION	DATE	BY	APR
4	UPDATED HEATER CONTROL AND TAG NUMBER	08/01/12	SE	J.LIN	5	ISSUED FOR APPROVAL	04/16/12	JMS	JL
3	UPDATED TAG NUMBERS	07/12/12	SE	J.LIN	4	ISSUED FOR CONSTRUCTION	05/02/12	JMS	J.LIN
2	REVISED PER CUSTOMER MARK UPS	06/12/12	SE	J.LIN	3	ISSUED FOR CONSTRUCTION	05/16/12	SE	J.LIN
1	REVISED PER CUSTOMER MARK UPS	05/16/12	SE	J.LIN	2	REVISED PER CUSTOMER MARK UPS	06/12/12	SE	J.LIN
0	ISSUED FOR CONSTRUCTION	05/02/12	JMS	J.LIN	1	UPDATED TAG NUMBERS	07/12/12	SE	J.LIN
6	AS BUILT	09/17/12	SE	AZ	0	ISSUED FOR APPROVAL	04/16/12	JMS	JL
5	REMOVED CYL. OIL DAY TANK LINE AND TAG CHANGE	08/30/12	SE	AZ					

DATE: 04/12/12 SCALE: NTS
 DRAWN BY: J. STEINKE CHECKED BY: S. PRITCHARD APPROVED BY: J.LIN
 PROJECT MANAGER: S. PRITCHARD PROJECT ENGINEER: J.LIN
 CUST PO: _____
 APEGGA PERMIT No: P8651 STEP CODE: 511 591 WORK ORDER: 31967

HUSKY OIL OPERATIONS LTD.
 WAUKESHA F18GL
 ARIEL JGJ/2-1/2 STD

ENERFLEX
 Calgary, Alberta,
 Canada

P & I DIAGRAM
 ENGINE LUBE OIL

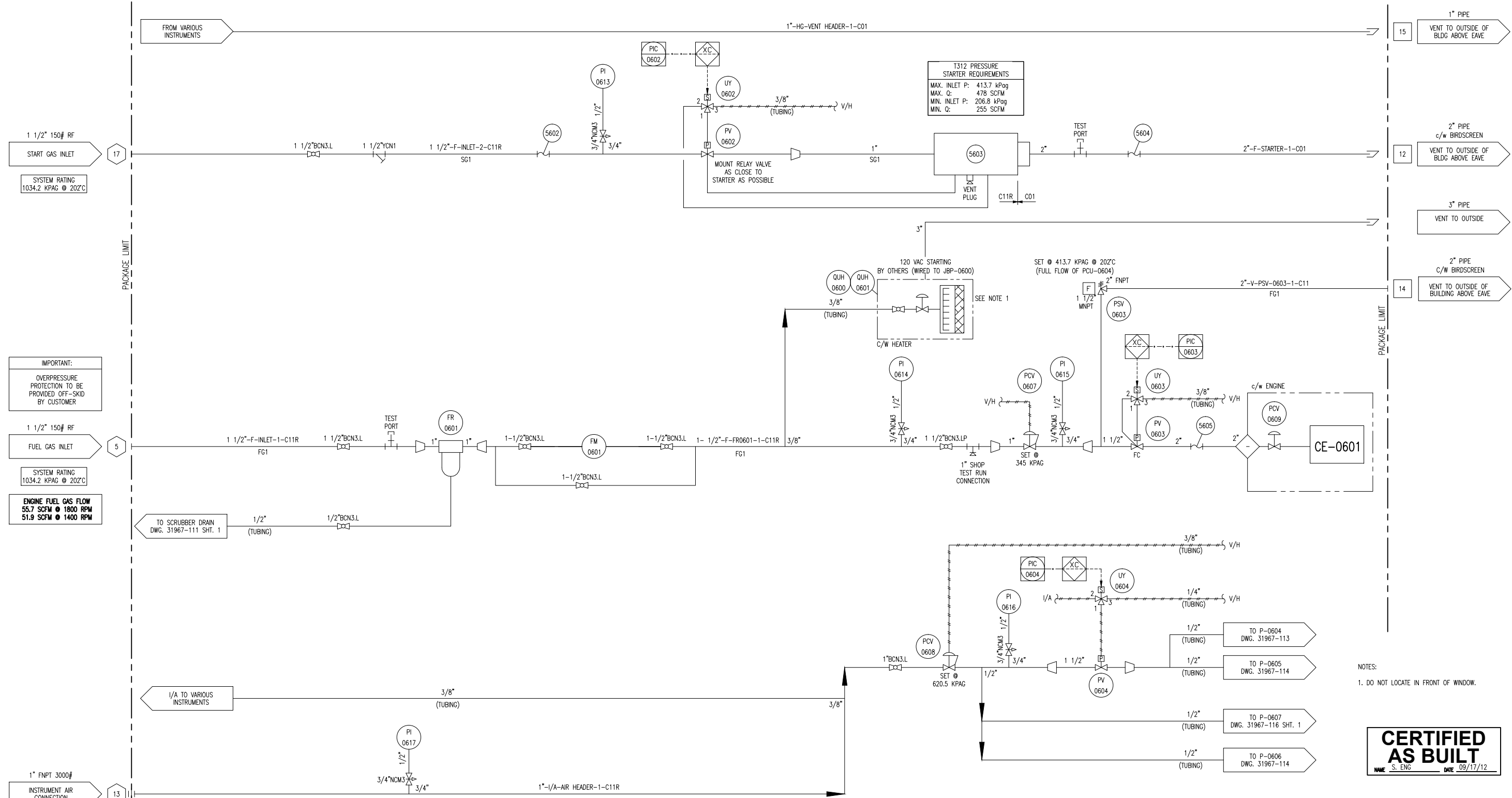
DWG NO: 31967-114 SHT: 1 REV: 6

**FR-0601
FUEL GAS FILTER**

MAKE: FINITE
MODEL: HN-45-10-CN
MAWP: 500 PSIG
1.0 MICRON

**QUH-0600/0601
BUILDING HEATER**

MAKE: CC1
MODEL: W2472
16 Btu/hr. 120 VAC
C/W GUARD AND HOOD



IMPORTANT:
OVERPRESSURE PROTECTION TO BE PROVIDED OFF-SKID BY CUSTOMER

1 1/2" 150# RF
FUEL GAS INLET
SYSTEM RATING
1034.2 KPAG @ 202°C
ENGINE FUEL GAS FLOW
55.7 SCFM @ 1800 RPM
51.9 SCFM @ 1400 RPM

NOTES:
1. DO NOT LOCATE IN FRONT OF WINDOW.

CERTIFIED AS BUILT
NAME: S. ENG DATE: 09/17/12

DATE: 04/12/12		SCALE: NTS		HUSKY OIL OPERATIONS LTD. WAUKESHA F18GL ARIEL JGJ/2-1/2 STD		ENERFLEX Calgary, Alberta, Canada		P & I DIAGRAM START / FUEL GAS SUPPLY	
2	AS BUILT	09/17/12	SE	AZ	DRAWN BY: J.STEINKE	CHECKED BY: J.LIN	APPROVED BY: S.PRITCHARD	DWG NO:	31967-115
1	REVISED TO CUSTOMER MARK UPS	05/16/12	SE	J.LIN	PROJECT MANAGER: S.PRITCHARD	PROJECT ENGINEER: J.LIN		SHT:	1
0	ISSUED FOR CONSTRUCTION	05/02/12	JMS	J.LIN	CUST PO			REV:	2
A	ISSUED FOR APPROVAL	04/16/12	JMS	JL					
REV	DESCRIPTION	DATE	BY	APR	APEGGA PERMIT No: P8651	STEP CODE: 511 591	WORK ORDER: 31967		

PLOT DATE: Sep 19, 2012, 9:58 AM F:\30000 Projects\30_31967-31967\31967-111_Rev2.dwg

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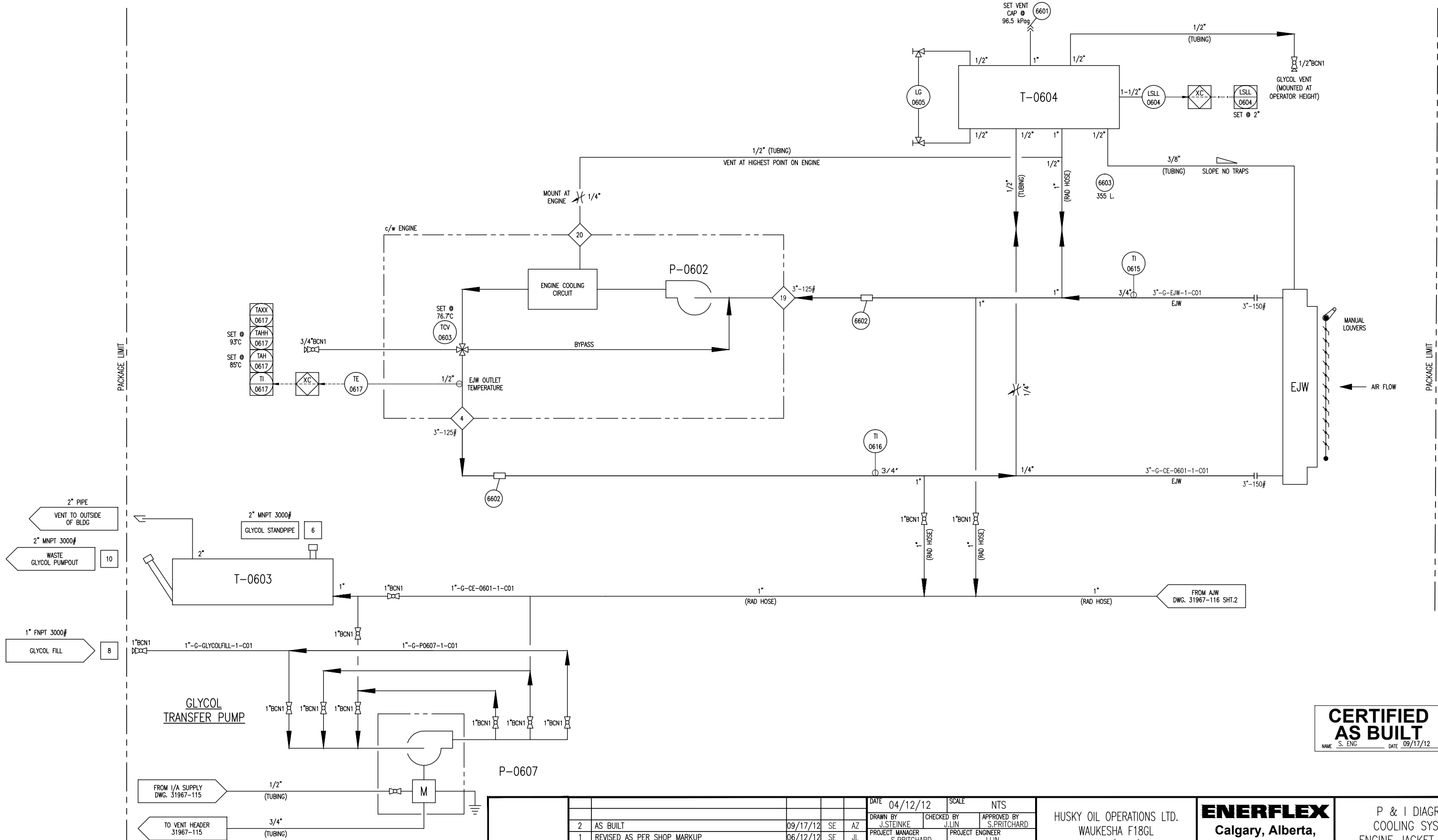
T-0603
WASTE GLYCOL TANK
 MFG: EFX
 SIZE: 12'x8'x1/4" HSS-19'-11"L
 MAT'L: SA-36
 CAPACITY: 330L

P-0607
GLYCOL TRANSFER PUMP
 MFG: YAMADA
 CPM: 49
 DRIVE: PNEUMATIC

P-0602
ENGINE JACKET
WATER PUMP
 MFG: WAUKESHA
 MAX. FLOW: 130 GPM
 DRIVE: ENGINE

T-0604
GLYCOL (EJW) SURGE TANK
 MFG: EFX
 CAPACITY: 53L
 SIZE: 10" TUBING x 60" LG
 MAT'L: SA-36

EJW (E-0600)
ENGINE JACKET WATER
COOLER SECTION
 MAWP: 96.5 kPag @ 149°C
 NON-CODE VESSEL



CERTIFIED AS BUILT
 NAME: S. ENG DATE: 09/17/12

REV	DESCRIPTION	DATE	BY	APR
2	AS BUILT	09/17/12	SE	AZ
1	REVISED AS PER SHOP MARKUP	06/12/12	SE	JL
0	ISSUED FOR CONSTRUCTION	05/02/12	JMS	J.LIN
A	ISSUED FOR APPROVAL	04/16/12	JMS	JL

DATE	04/12/12	SCALE	NTS
DRAWN BY	J.STEINKE	CHECKED BY	J.LIN
PROJECT MANAGER	S.PRITCHARD	PROJECT ENGINEER	J.LIN
CUST PO			

HUSKY OIL OPERATIONS LTD. WAUKESHA F18GL ARIEL JGJ/2-1/2 STD		ENERFLEX Calgary, Alberta, Canada	P & I DIAGRAM COOLING SYSTEM ENGINE JACKET WATER	
DWG NO	31967-116		SHT	1
REV	2	WORK ORDER	31967	

P:\30000 Projects\30_31900-31999\31967 Husky Oil - McMillen TCP - F18GL JGJ/2-1/2 - Drafting\RAD\31967-111_Rev2.dwg
 PLOT DATE Sep 19, 2012, 5:02 AM

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**E-0601
COMPRESSOR FRAME
OIL COOLER**

MFG: ARIEL
MODEL: B-1962
DWG #: A-4154

**P-0603
AUXILIARY JACKET
WATER PUMP**

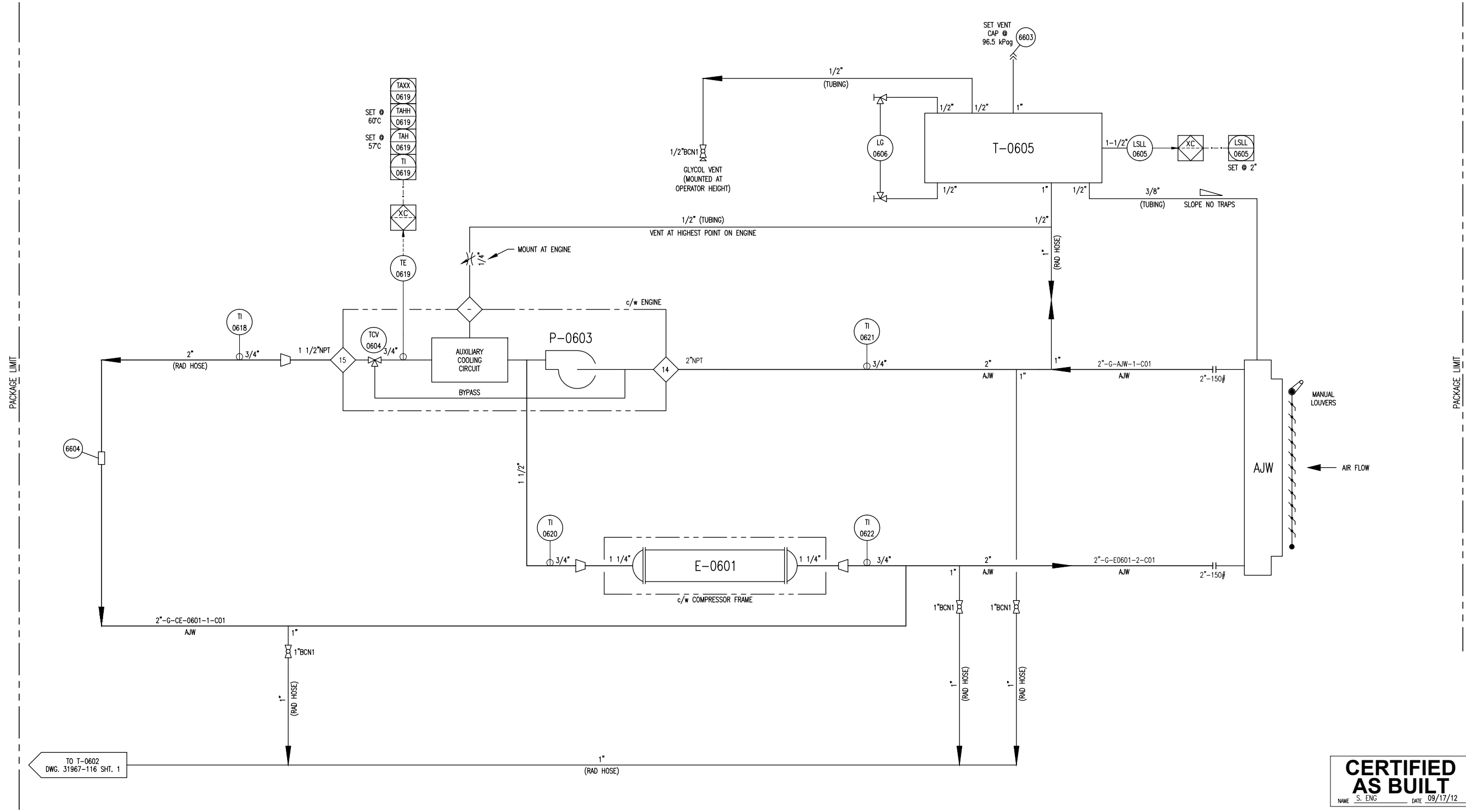
MFG: WAUKESHA
MAX. FLOW: 35 GPM
DRIVE: ENGINE

**T-0605
GLYCOL (AJW) SURGE TANK**

MFG: EFX
CAPACITY: 27L
SIZE: 10" TUBING x 60" LG
MAT'L: SA-36

**AJW (E-0600)
AUXILIARY JACKET WATER
COOLER SECTION**

MAWP: 96.5 KPAG @ 149°F
NON-CODE VESSEL



TO T-0602
DWG. 31967-116 SHT. 1

**CERTIFIED
AS BUILT**
NAME: S. ENG DATE: 09/17/12

P:\30000 Projects\30_31900-31999\31967 Husky 01 - McMillen TOP - F18G JGJ2\4. Drafting\RAD\31967-111_Rev2.dwg

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				DATE: 04/12/12	SCALE: NTS	HUSKY OIL OPERATIONS LTD. WAUKESHA F18GL ARIEL JGJ/2-1/2 STD	ENERFLEX Calgary, Alberta, Canada	P & I DIAGRAM COOLING SYSTEM AUXILIARY JACKET WATER		
DRAWN BY: J. STEINKE		CHECKED BY: J. LIN		APPROVED BY: S. PRITCHARD						
PROJECT MANAGER: S. PRITCHARD		PROJECT ENGINEER: J. LIN								
1	AS BUILT	09/17/12	SE	AZ						
0	ISSUED FOR CONSTRUCTION	05/02/12	JMS	J.LIN						
A	ISSUED FOR APPROVAL	04/16/12	JMS	JL						
REV	DESCRIPTION	DATE	BY	APR	APEGGA PERMIT No: P8651	STEP CODE: 511 531 591	WORK ORDER: 31967	DWG NO: 31967-116	SHT: 2	REV: 1

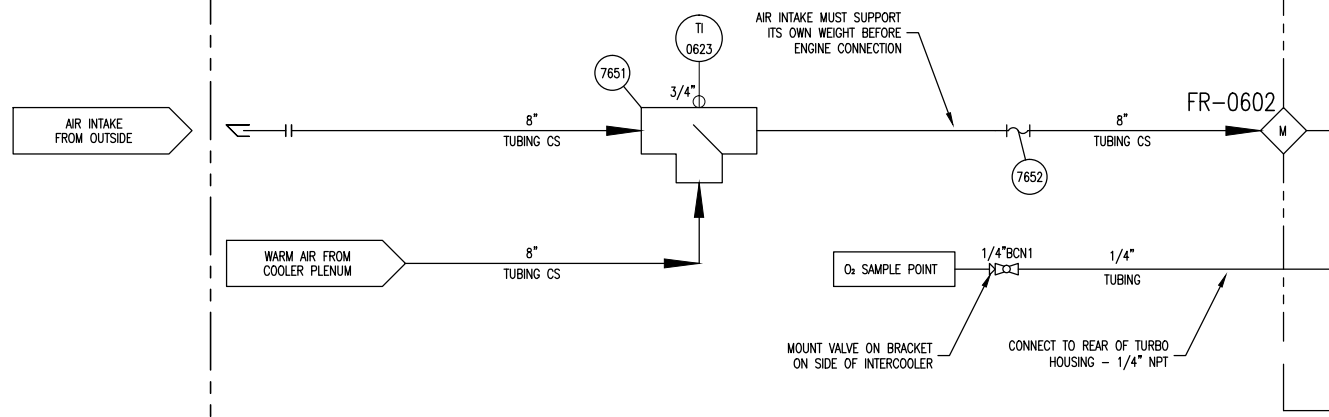
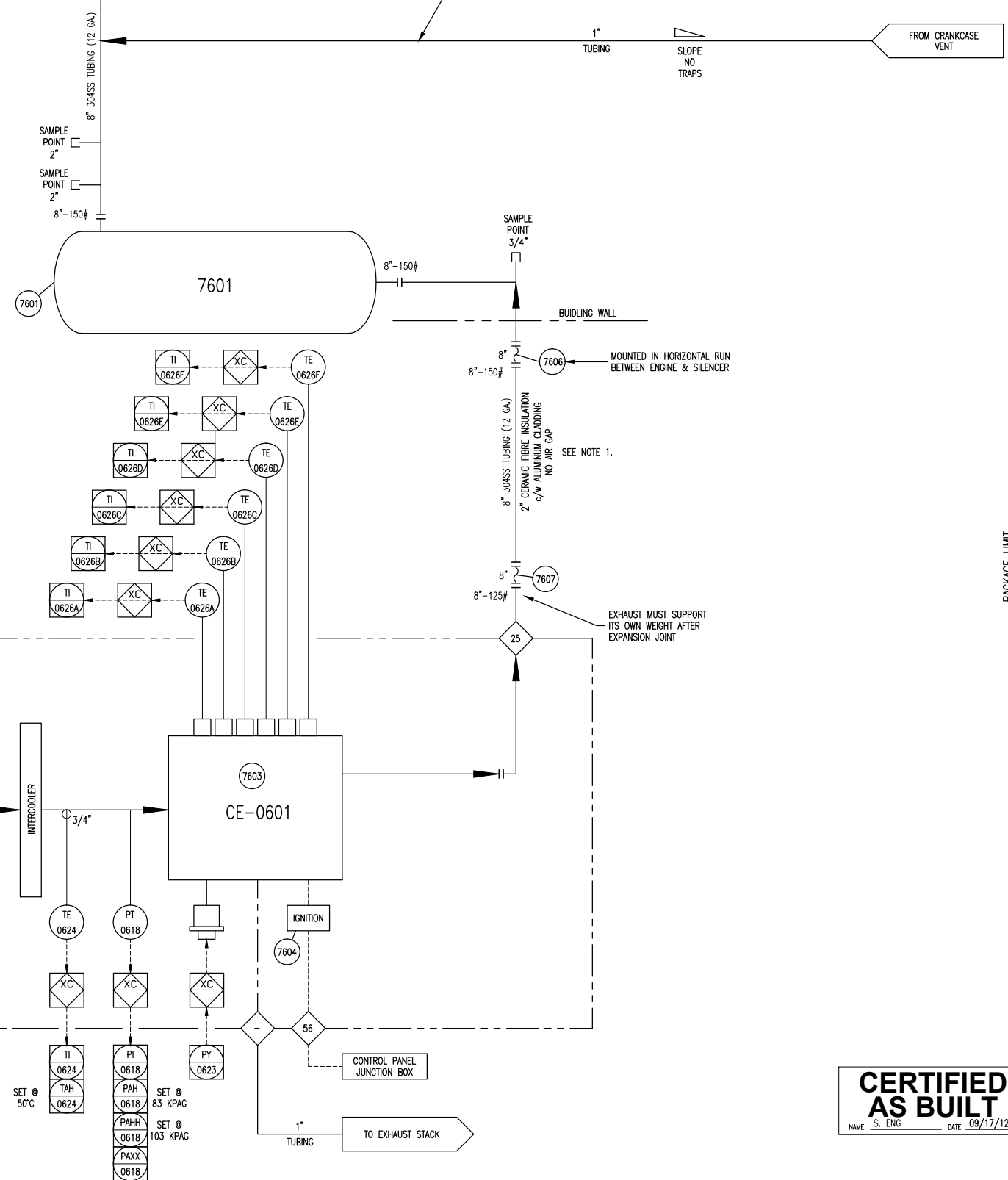
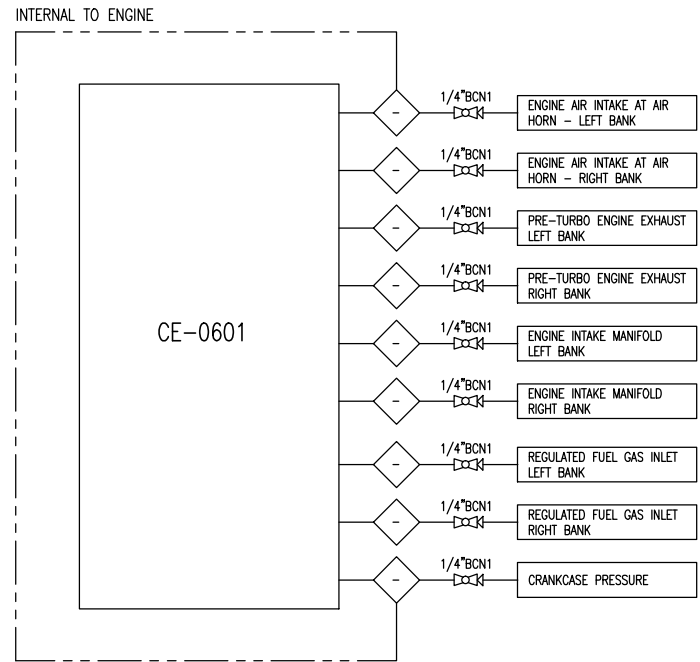
P:\0000 Projects\30_31900-31999\31967 Husky 01 - McMillen TOP - F18G1 JGJ2\4. Drafting\PK01\31967-111_Rev2.dwg
 PLOT DATE Sep 19, 2012, 5:02 PM

FR-0602
 AIR FILTER
 MFG: WAUKESHA
 QTY: 1

7601
 EXHAUST SILENCER
 MFG: SILEX
 MODEL: JDD5-8

18
 EXHAUST STACK
 1.2 TIMES
 BLDG PEAK HEIGHT
 FROM B.O.S. + 0.5 M

RUN CRANKCASE VENT LINE AS CLOSE
 AS POSSIBLE TO EXHAUST LINE/SILENCER



AIR INTAKE MUST SUPPORT
 ITS OWN WEIGHT BEFORE
 ENGINE CONNECTION

MOUNT VALVE ON BRACKET
 ON SIDE OF INTERCOOLER

CONNECT TO REAR OF TURBO
 HOUSING - 1/4" NPT

EXHAUST MUST SUPPORT
 ITS OWN WEIGHT AFTER
 EXPANSION JOINT

NOTES:
 1. INSULATION FROM ENGINE EXHAUST TO BUILDING WALL.

**CERTIFIED
 AS BUILT**
 NAME: S. ENG DATE: 09/17/12

DATE: 04/12/12		SCALE: NTS		HUSKY OIL OPERATIONS LTD. WAUKESHA F18GL ARIEL JGJ/2-1/2 STD		ENERFLEX Calgary, Alberta, Canada		P & I DIAGRAM AIR / EXHAUST SYSTEMS	
2	AS BUILT	09/17/12	SE	AZ	DRAWN BY: J. STEINKE	CHECKED BY: J. LIN	APPROVED BY: S. PRITCHARD	DWG NO: 31967-117	SHT: 1
1	ADDED THERMOCOUPLES TO CYLINDER EXHAUST	08/30/12	SE	AZ	PROJECT MANAGER: S. PRITCHARD	PROJECT ENGINEER: J. LIN		REV: 2	
0	ISSUED FOR CONSTRUCTION	05/02/12	JMS	J.LIN	CUST PO				
A	ISSUED FOR APPROVAL	04/16/12	JMS	JL	APEGGA PERMIT No: P8651		STEP CODE: 511 531 591	WORK ORDER: 31967	
REV	DESCRIPTION	DATE	BY	APR					

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P:\30000 Projects\30_31900-31999\31967 Husky Oil - Mukuluu TOP - F186_032\4. Drafting\AED\31967-11_Rev2.dwg PLOT DATE Sep 19, 2012, 2:02 PM

LINE IDENTIFICATION

A-B-CD-E-FGHI-J,J,J

- A: NOMINAL LINE SIZE IN INCHES
B: FLUID
C: EQUIPMENT TYPE
D: EQUIPMENT NUMBER 1 TO 9 SEQUENTIAL NUMBERS
E: LINE NUMBER 1 TO 9 SEQUENTIAL NUMBERS FROM EQUIPMENT
FGHI: PIPING SPECIFICATION
F: MATERIAL GROUP
G: FLANGE CLASS (ANSI 16.5)
H: LINE MATERIAL SPECIFICATION REFERENCE
I: SPECIFICATION REFERENCE
JJ: MODIFIER / GENERAL
EXAMPLE: 3"-A-V401-2-C11R-ET,1"

VALVE IDENTIFICATION

A"BCDE.F

- A: NOMINAL VALVE SIZE IN INCHES
B: TYPE
C: BODY MATERIAL
D: END CONNECTIONS
E: IDENTIFIER - NUMBER USED TO SPECIFY VALVE REFER TO VALVE DATA SHEETS
F: MODIFIER
EXAMPLE: 6"GC11.C

LINE CODE

- MAIN PROCESS LINE
SECONDARY PROCESS LINE
AUXILIARY LINE
INSTRUMENT LINE
ELECTRIC LINE
FILLED CAPILLARY TUBE
PNEUMATIC LINE
MECHANICAL LINK
INSTRUMENT DATA LINK
INTERCONNECTING PIPING
SKID LIMIT
FUTURE

VALVES

- ANGLE GLOBE VALVE
BALL VALVE
BUTTERFLY VALVE
CHECK VALVE
GATE VALVE
GLOBE VALVE
NEEDLE VALVE
NEEDLE VALVE W/ BLEED PLUG
PLUG VALVE
3-WAY VALVE
4-WAY VALVE

CONTROL VALVES

- POSITIONER DIAPHRAGM CONTROL VALVE
OUTLET PRESSURE REGULATOR SELF-CONTAINED
INLET PRESSURE REGULATOR SELF-CONTAINED
PRESSURE DIFFERENTIAL CONTROL VALVE SELF-CONTAINED
DIAPHRAGM CONTROL VALVE
HYDRAULIC / PNEUMATIC PISTON OPERATED
PNEUMATIC RELAY VALVE
TWO-WAY SOLENOID VALVE
THREE-WAY SOLENOID VALVE
MOTOR ACTUATOR
HAND CONTROL VALVE
PRESSURE SAFETY / RELIEF VALVE
DESIGNATES ORIFICE LETTER (SIZE)

MISCELLANEOUS

- SKID TIE-POINTS
SKID CONNECTION NOT REQUIRING CUSTOMER TIE IN
FLEXIBLE/ EXPANSION CONNECTION
SPECTACLE BLIND (LINE OPEN)
SPECTACLE BLIND (LINE CLOSED)
BALL CHECK VALVE
THROTTLE BLOCK
BOTTLE CLAMP
SPACER / ORIFICE
CONE STRAINER
BASKET STRAINER
Y-PATTERN STRAINER
TEE STRAINER
OPEN DRAIN
SPECIAL CLAMPING
WEDGE SUPPORT
UNION
SIGHT GLASS
LINE SIZE CHANGE
SPECIALTY ITEM
VORTEX BREAKER
DIAPHRAGM SEAL
RUPTURE DISC FOR PRESSURE RELIEF
RUPTURE DISC FOR VACUUM RELIEF
ELECTRIC HEAT TRACE
STEAM OR GLYCOL HEAT TRACE

(MODIFIER)

Table with columns: FIRST LETTER, SUCCEEDING LETTERS, PRIMARY ELEMENT, INDICATOR, RECORDER, CONTROLLER, TRANS-MITTER, CONTROL, CONTROL VALVE OR REGULATOR, SELF-ACTUATED VALVE, RELAY OR CONVERTER. Rows include ANALYSIS, BURNER FLAME, CONDUCTIVITY, etc.

INSTRUMENT IDENTIFICATION GENERAL REFERENCE (ISA - S5.1)

Table with columns: PRIMARY ELEMENT, INDICATOR, RECORDER, CONTROLLER, TRANS-MITTER, CONTROL, CONTROL VALVE OR REGULATOR, SELF-ACTUATED VALVE, RELAY OR CONVERTER. Rows include ANALYSIS, BURNER FLAME, CONDUCTIVITY, etc.

VALVE CONNECTIONS

- SCREWED (NPT)
FLANGED
SOCKET WELDED (SW)
NPT BY SW
BUTT WELDED (BW)

(C) -CLOSE (O) -OPEN (H) -HIGH ALARM (L) -LOW ALARM (HH)-HIGH SHUTDOWN (LL)-LOW SHUTDOWN (xx) -DIAGNOSTIC SHUTDOWN (USED TO INDICATE THE DIAGNOSTIC CHECK REQ'D ON THE ANALOG INPUT)

INSTRUMENTS

- LOCAL MOUNTED
LOCAL PANEL MOUNTED
MOUNTED BEHIND OR IN LOCAL PANEL
MAIN PANEL MOUNTED
MOUNTED BEHIND OR IN MAIN PANEL
BY OTHERS
HUMAN MACHINE INTERFACE(HMI) ACCESSIBLE TO OPERATOR
HUMAN MACHINE INTERFACE(HMI) ACCESSIBLE TO OPERATOR THROUGH LOCAL PLC
BY OTHERS
PROGRAMMABLE LOGIC CONTROLLER (PLC)
PILOT LIGHT * COLOR-(A) AMBER (G) GREEN (R) RED (B) BLUE (O) ORANGE (W) WHITE
INTERLOCK
ELECTRICAL (HARD WIRE) INTERLOCK
THERMOWELL (FLANGED)
THERMOWELL (THREADED)
THERMOWELL (WELDED)

ABBREVIATIONS

- BW BUTT WELD
CA CORROSION ALLOWANCE
CS CARBON STEEL
C/W COMPLETE WITH
CSC CAR SEALED CLOSED
CSO CAR SEALED OPEN
CUST CUSTOMER
DB DEAD BAND
DELTA (DIFFERENTIAL)
DIR DIRECT ACTING
ESD EMERGENCY SHUTDOWN
FC FAIL CLOSED
FF FLAT FACED
FO FAIL OPEN
FLP FAIL LAST POSITION
FX FROST EXTENSION
FOT FLAT ON TOP
HI HIGH
HLL HIGH LIQUID LEVEL
HS HAND SWITCH
I/A INSTRUMENT AIR
I/G INSTRUMENT GAS
I/P CURRENT TO PRESSURE
I/O INPUT / OUTPUT
LLL LOW LIQUID LEVEL
LPD LOW POINT DRAIN
MAX MAXIMUM
MAWP MAXIMUM ALLOWABLE WORKING PRESSURE
MDMT MAXIMUM DESIGN METAL TEMPERATURE
MCC MOTOR CONTROL CENTER
MIN MINIMUM
NLL NORMAL LIQUID LEVEL
NC NORMALLY CLOSED
NO NORMALLY OPEN
NPT NATIONAL PIPE THREAD (SCREWED)
PB PUSH BUTTON
PL PILOT LIGHT
PLC PROGRAMMABLE LOGIC CONTROLLER
REV REVERSE ACTING
RF RAISED FACE
RTD RESISTANCE TEMPERATURE DEVICE
RTJ RING TYPE JOINT
S/F SEAM TO FACE OF FLANGE
SS STAINLESS STEEL
S/S SEAM TO SEAM
SO SLIP-ON
SW SOCKET WELD
SVU SUCTION VALVE UNLOADER
T TUBING
TESI TOROMONT ENERGY SYSTEMS INC.
V/H VENT HEADER
VTA VENT TO ATMOSPHERE
WCP VARIABLE VOLUME CONTROL POCKET
FVCP FIXED VOLUME CONTROL POCKET
W/ WITH
W/O WITHOUT

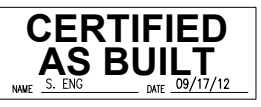


Table with columns: DATE, SCALE, DRAWN BY, CHECKED BY, APPROVED BY, PROJECT MANAGER, PROJECT ENGINEER, HUSKY OIL OPERATIONS LTD., WAUKESHA F18GL, ARIEL JGJ/2-1/2 STD, ENERFLEX, Calgary, Alberta, Canada, LEGEND, DWG NO, SHT, REV.

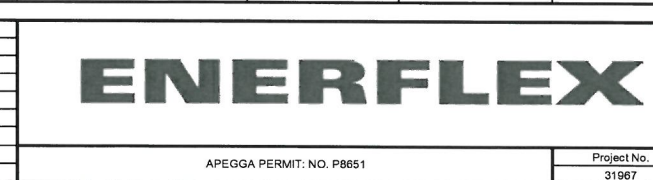
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FLOW DIAGRAM	FLOW REV.	ENERFLEX LINE NUMBER	SPOOL SHEET #	SERVICE	SIZE (mm)	FROM	TO	PIPE SPEC	WALL THICKNESS (SCHEDULE)	DESIGN PRESSURE (kPag)	DESIGN TEMP. (°C)	CORROSION ALLOWANCE (mm.)	TEST PRESSURE (kPag)	X-RAY (%)	NOTES	PIPE MATERIAL	FLANGE MATERIAL	CODE	PWHT
31967-111-1	1	6"-HG-INLET-1-L31R	1	SWEET GAS	4" / 6"	SKID EDGE CONNECTION 1 AIR INLET / 4"-HG-BYPASS-1-C31R	6"-HG-INLET-1-C31R / SUCTION SCRUBBER V-0601	L31R	STD	4516	149 / -45	1.6	7446	10%	1,3	SA-333 GR. 6	SA-350-LF2	B31.3 2010	NO
31967-111-1 / 31967-111-2	1	6"-HG-INLET-1-C31R	1	SWEET GAS	3" / 4" / 6"	6"-HG-INLET-1-L31R	4"-HG-IC1-1-C31R	C31R	STD	4516	149 / -29	1.6	7446	10%	1,3	SA-106-B	SA-105	B31.3 2010	NO
31967-111-1	1	6"-HG-V0601-1-C31R	2	SWEET GAS	6"	1ST STAGE SUCTION SCRUBBER V-0601	1ST STAGE SUCTION BOTTLE V-0602	C31R	STD	4516	149 / -29	1.6	7446	10%	1,3	SA-106-B	SA-105	B31.3 2010	NO
31967-111-1	1	4"-HG-CYL-0601-1-C31R	3	SWEET GAS	1.5" / 4"	1ST STAGE DISCHARGE BOTTLE V-0603	4"-HG-CYL-0601-2-L31R / PSV-0601	C31R	XS / STD	4447	177 / -29	1.6	7453	10%	1,3	SA-106-B	SA-105	B31.3 2010	NO
31967-111-1	1	4"-HG-CYL-0601-2-L31R	3	SWEET GAS	2" / 4"	4"-HG-CYL-0601-1-C31R	2"-HG-CYL-0601-1-C31R / 1ST STAGE INTERCOOLER E-0600	L31R	XS / STD	4447	177 / -45	1.6	7453	10%	1,3	SA-333 GR. 6	SA-350-LF2	B31.3 2010	NO
31967-111-1 / 31967-111-2	1	2"-HG-CYL-0601-1-C31R	3	SWEET GAS	2"	4"-HG-CYL-0601-2-L31R	4"-HG-CYL-0602-2-L61R	C31R	XS	4447	177 / -29	1.6	7453	10%	1,3	SA-106-B	SA-105	B31.3 2010	NO
31967-111-1	1	4"-HG-IC1-1-L31R	4	SWEET GAS	4"	1ST STAGE INTERCOOLER E-0600	4"-HG-IC1-1-C31R / 4"-HG-IC1-2-C31R	L31R	STD	4516	149 / -29	1.6	7446	10%	1,3	SA-333 GR. 6	SA-350-LF2	B31.3 2010	NO
31967-111-1 / 31967-111-2	1	4"-HG-IC1-1-C31R	4	SWEET GAS	4" / 6"	4"-HG-IC1-1-L31R / 6"-HG-INLET-1-C31R	2ND STAGE SUCTION SCRUBBER V-0604	C31R	STD	4516	149 / -45	1.6	7446	10%	1,3	SA-106-B	SA-105	B31.3 2010	NO
31967-111-1 / 31967-111-2	1	4"-HG-IC1-2-C31R	5	SWEET GAS	4"	4"-HG-IC1-1-L31R	4"-HG-AC-1-L61R	C31R	STD	4516	149 / -29	1.6	7446	10%	1,3	SA-106-B	SA-105	B31.3 2010	NO
31967-111-2	1	6"-HG-V0604-1-C31R	6	SWEET GAS	6"	2ND STAGE SUCTION SCRUBBER V-0604	2ND STAGE SUCTION BOTTLE V-0605	C31R	STD	4516	149 / -29	1.6	7446	10%	1,3	SA-106-B	SA-105	B31.3 2010	NO
31967-111-2	1	4"-HG-CYL-0602-1-C61R	7	SWEET GAS	4"	2ND STAGE DISCHARGE BOTTLE V-0606	4"-HG-CYL-0602-2-L61R	C61R	XS	8880	177 / -29	1.6	14886	10%	1,3	SA-106-B	SA-105	B31.3 2010	NO
31967-111-2	1	4"-HG-CYL-0602-2-L61R	7	SWEET GAS	1.5" / 2" / 3" / 4"	4"-HG-CYL-0602-1-C61R / 2"-HG-CYL-0601-1-C31R	2ND STAGE AFTER COOLER E-0600	L61R	XS	8880	177 / -45	1.6	14886	10%	1,3	SA-333 GR. 6	SA-350-LF2	B31.3 2010	NO
31967-111-2	1	4"-HG-AC-1-L61R	8	SWEET GAS	3" / 4"	2ND STAGE AFTER COOLER E-0600 / 4"-HG-IC1-2-C61R	4"-HG-AC-1-C61R	L61R	XS	8880	177 / -45	1.6	14886	10%	1,3	SA-333 GR. 6	SA-350-LF2	B31.3 2010	NO
31967-111-2	1	4"-HG-AC-1-C61R	8	SWEET GAS	4"	4"-HG-AC-1-L61R	4"-HG-AC-2-L61R / 4"-HG-BYPASS-1-C61R	C61R	XS	8880	177 / -29	1.6	14886	10%	1,3	SA-106-B	SA-105	B31.3 2010	NO
31967-111-2	1	4"-HG-AC-2-L61R	8	SWEET GAS	4"	4"-HG-AC-1-C61R	SKID EDGE CONNECTION 2 FINAL DISCHARGE	L61R	XS	8880	177 / -45	1.6	14886	10%	1,3	SA-333 GR. 6	SA-350-LF2	B31.3 2010	NO
31967-111-2	1	4"-HG-BYPASS-1-C61R	9	SWEET GAS	1.5" / 2" / 4"	4"-HG-AC-1-C61R	4"-HG-BYPASS-1-C31R / 1 1/2"-HG-BLOWDOWN-1-C11R	C61R	XS	8880	177 / -45	1.6	14886	10%	1,3	SA-106-B	SA-105	B31.3 2010	NO
31967-111-2 / 31967-111-1	1	4"-HG-BYPASS-1-C31R	10	SWEET GAS	2" / 4"	4"-HG-BYPASS-1-C61R	6"-HG-INLET-1-L31R	C31R	XS / STD	4516	149 / -29	1.6	7446	10%	1,3	SA-106-B	SA-105	B31.3 2010	NO
31967-111-2 / 31967-111-1	1	1 1/2"-HG-BLOWDOWN-1-C11R	11	SWEET GAS	1.5"	4"-HG-BYPASS-1-C61R	4"-HG-PSV-2-L11R	C11R	XS	1586	149 / -29	1.6	2613	10%	1,3	SA-106-B	SA-105	B31.3 2010	NO
31967-111-1 / 31967-111-2	1	4"-HG-PSV-1-C11R	12	SWEET GAS	2" / 4"	PSV-0602 / PSV-0601	4"-HG-PSV-2-C11R	C11R	XS / STD	1586	149 / -29	1.6	2613	10%	1,3	SA-106-B	SA-105	B31.3 2010	NO
31967-111-1	1	4"-HG-PSV-2-C11R	13	SWEET GAS	4"	4"-HG-PSV-1-C11R	4"-HG-PSV-2-L11R	C11R	STD	1586	177 / -29	1.6	2613	10%	1,3	SA-106-B	SA-105	B31.3 2010	NO
31967-111-1	1	4"-HG-PSV-2-L11R	13	SWEET GAS	1.5" / 4"	1 1/2"-HG-BLOWDOWN-1-C11R / 4"-HG-PSV-1-C11R	4"-HG-PSV-3-C01	L11R	XS / STD	1586	177 / -45	1.6	2613	10%	1,3	SA-333 GR. 6	SA-350-LF2	B31.3 2010	NO
31967-111-1	1	4"-HG-PSV-3-C01	14	SWEET GAS	4"	4"-HG-PSV-2-L11R	SKID EDGE CONNECTION 3 VENT TO OUTSIDE OF BUILDING	C01	STD	N/A	N/A	1.6	N/A	10%	-	SA-333 GR. 6	SA-350-LF2	B31.3 2010	NO
31967-111-1	1	1 1/2"-HL-V-0601-1-L11R	-	SCRUBBER DRAIN	1.5" / 2"	1 1/2"-HL-V0601-1-C11R	SKID EDGE CONNECTION 4 SCRUBBER DRAIN HEADER	L11R	XS	1586	149 / -45	1.6	1744	0%	2	SA-333 GR. 6	SA-350-LF2	B31.3 2010	NO
31967-111-1	1	1 1/2"-HL-V0601-1-C11R	-	SCRUBBER DRAIN	1.5"	1"-HL-V-0601-1-C31R / 1"-HL-V-0604-1-C31R / FR-0601	1 1/2"-HL-V-0601-1-L11R	C11R	XS	1586	149 / -29	1.6	1744	0%	2	SA-106-B	SA-105	B31.3 2010	NO
31967-111-1	1	1"-HL-V-0601-1-C31R	-	SCRUBBER DRAIN	1"	1ST STAGE SUCTION SCRUBBER V-0601	1 1/2"-HL-V0601-1-C11R	C31R	160	4516	149 / -29	1.6	7446	10%	1	SA-106-B	SA-105	B31.3 2010	NO
31967-111-2	1	1"-HL-V-0604-1-C31R	-	SCRUBBER DRAIN	1"	2ND STAGE SUCTION SCRUBBER V-0604	1 1/2"-HL-V0601-1-C11R	C31R	160	4516	149 / -29	1.6	7446	10%	1	SA-106-B	SA-105	B31.3 2010	NO
31967-115-1	1	1 1/2"-F-INLET-2-C11R	-	START GAS	1" / 1.5"	SKID EDGE CONNECTION 17 START GAS INLET	ENGINE STARTER 5603	C11R	XS	1034	202 / -29	1.6	1137	0%	2	SA-106-B	SA-105	B31.3 2010	NO
31967-115-1	1	1 1/2"-F-INLET-1-C11R	-	FUEL GAS	1" / 1.5"	SKID EDGE CONNECTION 5 FUEL GAS INLET	FUEL FILTER FR-0601	C11R	XS	1034	202 / -29	1.6	1137	0%	2	SA-106-B	SA-105	B31.3 2010	NO
31967-115-1	1	1 1/2"-F-FR0601-1-C11R	-	FUEL GAS	1" / 1.5" / 2"	FUEL FILTER FR-0601	PSV-0603 / HEATERS QUH-0600 / QUH-0601 / ENGINE CE-0601	C11R	XS	1034	202 / -29	1.6	1137	0%	2	SA-106-B	SA-105	B31.3 2010	NO
31967-115-1	1	1"-I/A-AIR HEADER-1-C11R	-	INSTRUMENT AIR	1" / 1.5"	SKID EDGE CONNECTION 13 INSTRUMENT AIR CONNECTION	P-0604 / P-0605 / P-0606 / P-0607 / VARIOUS INSTRUMENTS	C11R	XS	1034	66 / -29	1.6	1137	0%	2	SA-106-B	SA-105	B31.3 2010	NO

NOTE 1: TEST MEDIUM TO BE H₂O - MINIMUM DURATION 10 MINUTES
NOTE 2: TEST MEDIUM TO BE AIR
NOTE 3: 10% MPI ON ALL FILLET WELDS INCLUDING PSV GUSSETS

PSV TAG#	DRAWING #	DRAWING REV.	MAKE	MODEL #	INLET	OUTLET	SET AT	VESSLS PROTECTED
PSV-0601	31967-111-1	1	FARRIS	26FA12-140	1.5" 300# RF	2" 150# RF	4447 kPag	1st Stage Suction Scrubber V-0601, 1st Stage Suction Bottle V-0602, 1st Stage Discharge Bottle V-0603, 1st Stage Cooler E-0600, 2nd Stage Suction Scrubber V-0604, 2nd Stage Suction Bottle V-0605
PSV-0602	31967-111-2	1	FARRIS	26FA13-140	1.5" 600# RF	2" 150# RF	4447 kPag	2nd Stage Discharge Bottle V-0606, After Cooler E-0600
PSV-0603	31967-115-1	1	FARRIS	27FA45-M20	1.5" MNPT	2" FNPT	414 kPag	Fuel Gas Line

REVISIONS	NO.	ISSUE	DATE
	0	RELEASED FOR APPROVAL	11-May-12
	1	ISSUE FOR STAMPING	6/15/2012



Husky Oil Operations
LSD: 03-35-078-25-W4M
Engine: WALKESHA LEAN BURN
Frame: ARIEL JGJ/2
Cooler: AIRXLT, 96AEF-R

NOTE: THE FLOW DRAWINGS AND THIS LINE LIST HAVE BEEN P. ENG STAMPED BASED ON THE ORIGINAL COMPRESSOR PACKAGE DESIGN DURING FABRICATION. ENERFLEX IS NOT RESPONSIBLE FOR THE CHANGES THAT MAY HAVE OCCURRED DURING THE FIELD INSTALLATION AND OPERATION OF THE UNIT

PROFESSIONAL ENGINEER STAMP

18 JUNE 2012

**V-0601
1ST STAGE
SUCTION SCRUBBER**

MFG: EFX
SIZE: 24" OD X 66" S/S
MAWP: 4516.1 kPag @ 149°C
MDMT: -29°C @ 4516.1 kPag
CA: 1/16"
MAT'L: SA-106-B
ELEMENTS: MESH PAD

**V-0602
1ST STAGE
SUCTION BOTTLE**

MFG: EFX
SIZE: 12 3/4" OD X 20" S/S
MAWP: 4516.1 kPag @ 149°C
MDMT: -29°C @ 4516.1 kPag
CA: 1/16"
MAT'L: SA-106-B

**V-0603
1ST STAGE
DISCHARGE BOTTLE**

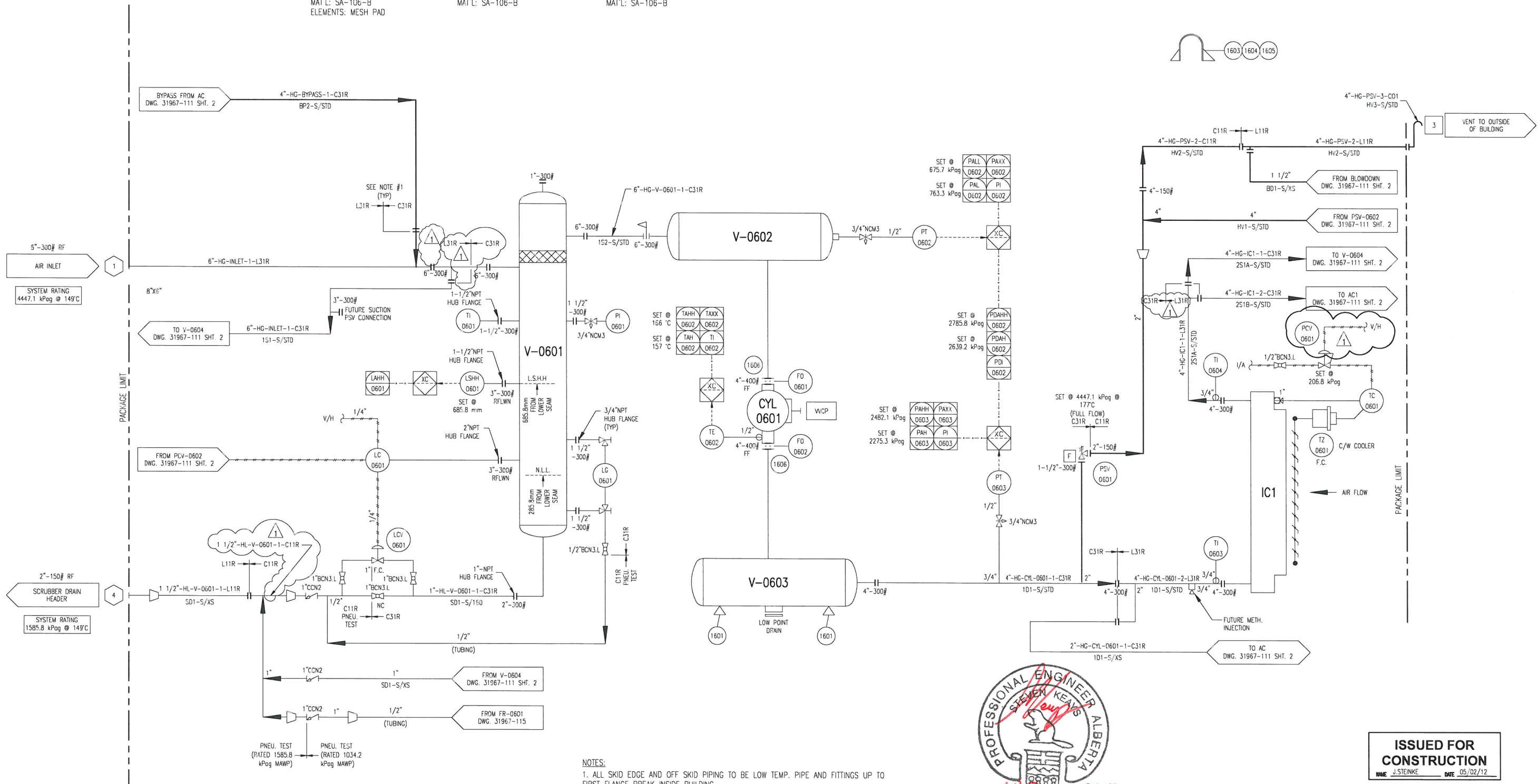
MFG: EFX
SIZE: 12 3/4" OD X 36" S/S
MAWP: 4447.1 kPag @ 177°C
MDMT: -29°C @ 4447.1 kPag
CA: 1/16"
MAT'L: SA-106-B

**CYL-0601
1ST STAGE
COMPRESSION CYLINDER**

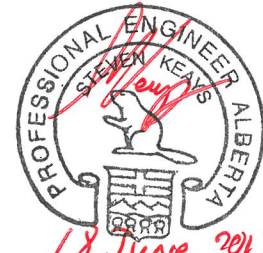
MFG: ARIEL
MODEL: 7 3/8 RJ
SIZE: 7.375" BORE
MAWP: 5826.1 kPag
THROW: #1

**IC1 (E-0600)
1ST STAGE
COOLER SECTION**

MAWP: 4447.1 kPag @ 177°C
MDMT: -45°C @ 4447.1 kPag
CA: 1/16"



NOTES:
1. ALL SKID EDGE AND OFF SKID PIPING TO BE LOW TEMP. PIPE AND FITTINGS UP TO FIRST FLANGE BREAK INSIDE BUILDING.



ISSUED FOR CONSTRUCTION
J. STEINKE DME 05/02/12

				DATE	04/12/12	SCALE	NTS	HUSKY OIL OPERATIONS LTD. WAUKESHA F18GL ARIEL JG/2-1/2 STD		ENERFLEX Calgary, Alberta, Canada	P & I DIAGRAM PROCESS GAS STAGE #1		
				DRAWN BY	J. STEINKE	CHECKED BY	J. LIN	APPROVED BY S. PRITCHARD			DWG NO	31967-111	SHT
1	REVISED TO CUSTOMER MARK UPS	05/16/12	JMS	A.D.	PROJECT MANAGER		S. PRITCHARD	PROJECT ENGINEER		J. LIN	REV	1	
0	ISSUED FOR CONSTRUCTION	05/02/12	JMS	J.LIN	CUST PO								
A	ISSUED FOR APPROVAL	04/16/12	JMS	JL	APEGGA PERMIT No:		P8651	STEP CODE		490 511 591	WORK ORDER	31967	
REV	DESCRIPTION	DATE	BY	APR									

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V-0604
2ND STAGE
SUCTION SCRUBBER

MFG: EFX
SIZE: 20" OD X 66" S/S
MAWP: 4516.1 kPag @ 149°C
MDMT: -29°C @ 4516.1 kPag
CA: 1/16"
MAT'L: SA-106-B
ELEMENTS: MESH PAD

V-0605
2ND STAGE
SUCTION BOTTLE

MFG: EFX
SIZE: 12 3/4" OD X 20" S/S
MAWP: 4516.1 kPag @ 149°C
MDMT: -29°C @ 4516.1 kPag
CA: 1/16"
MAT'L: SA-106-B

V-0606
2ND STAGE
DISCHARGE BOTTLE

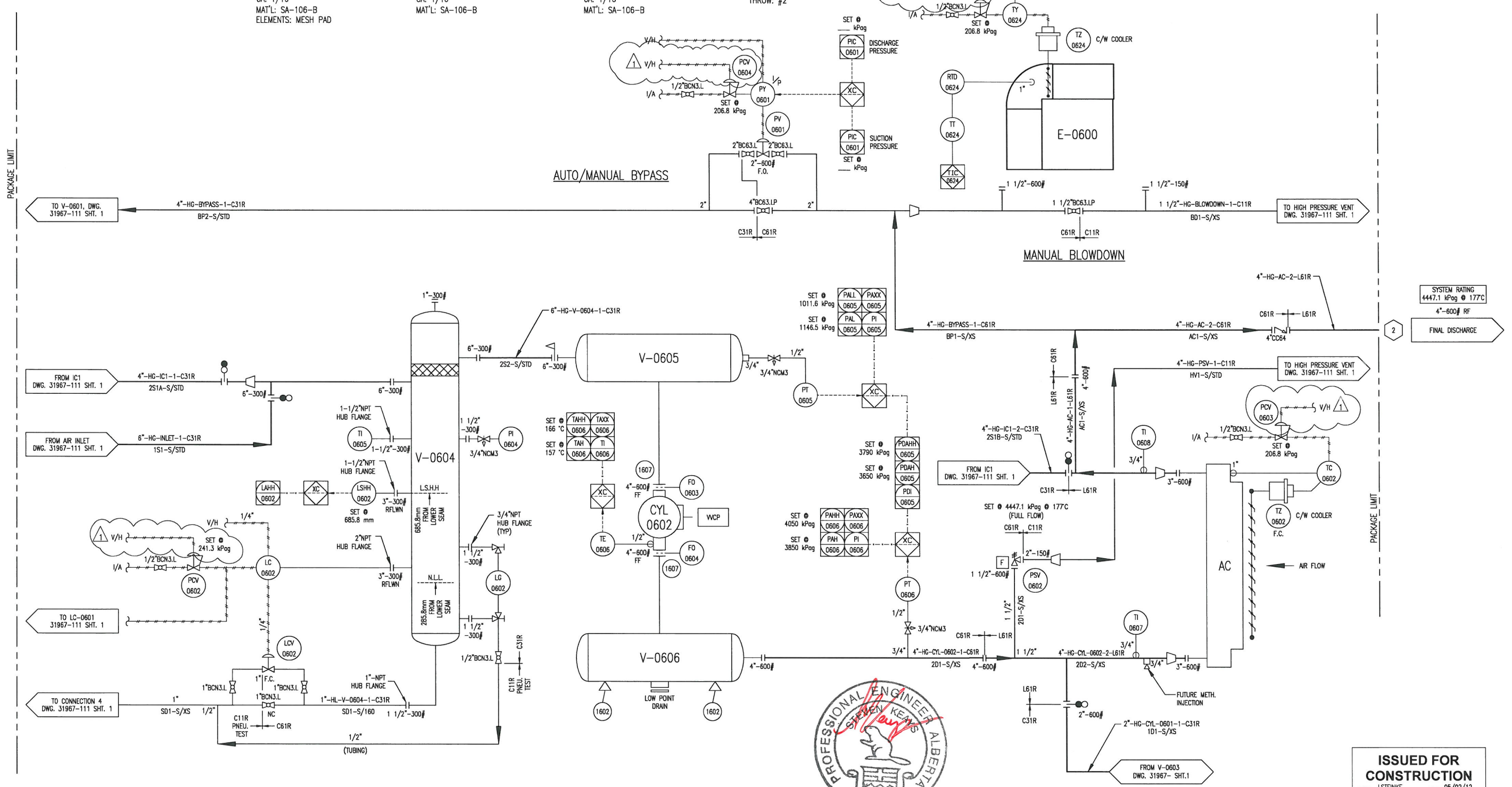
MFG: EFX
SIZE: 12.75" OD X 36" S/S
MAWP: 8756.3 kPag @ 177°C
MDMT: -29°C @ 8756.3 kPag
CA: 1/16"
MAT'L: SA-106-B

CYL-0602
2ND STAGE
COMPRESSION CYLINDER

MFG: ARIEL
MODEL: 6 3/8 RJ
SIZE: 6.000" BORE
MAWP: 8756.3 kPag
THROW: #2

AC (E-0600)
2ND STAGE
COOLER SECTION

MAWP: 8873.6 kPag @ 177°C
MDMT: -45°C @ 8873.6 kPag
CA: 1/16"



SYSTEM RATING
4447.1 kPag @ 177°C
4"-600# RF
FINAL DISCHARGE



ISSUED FOR CONSTRUCTION
NAME: J. STEINKE DATE: 05/02/12

DATE: 04/12/12		SCALE: NTS		HUSKY OIL OPERATIONS LTD. WAUKESHA F18GL ARIEL JGJ/2-1/2 STD		ENERFLEX Calgary, Alberta, Canada		P & I DIAGRAM PROCESS GAS STAGE #2	
DRAWN BY: J. STEINKE		CHECKED BY: S. PRITCHARD		APPROVED BY: J. LIN		DWG NO: 31967-111		SHT: 2	
PROJECT MANAGER: S. PRITCHARD		PROJECT ENGINEER: J. LIN		CUST PO		REV: 1			
REV	DESCRIPTION	DATE	BY	APR	APEGGA PERMIT No: P8651	STEP CODE: 490 511 591	WORK ORDER: 31967		

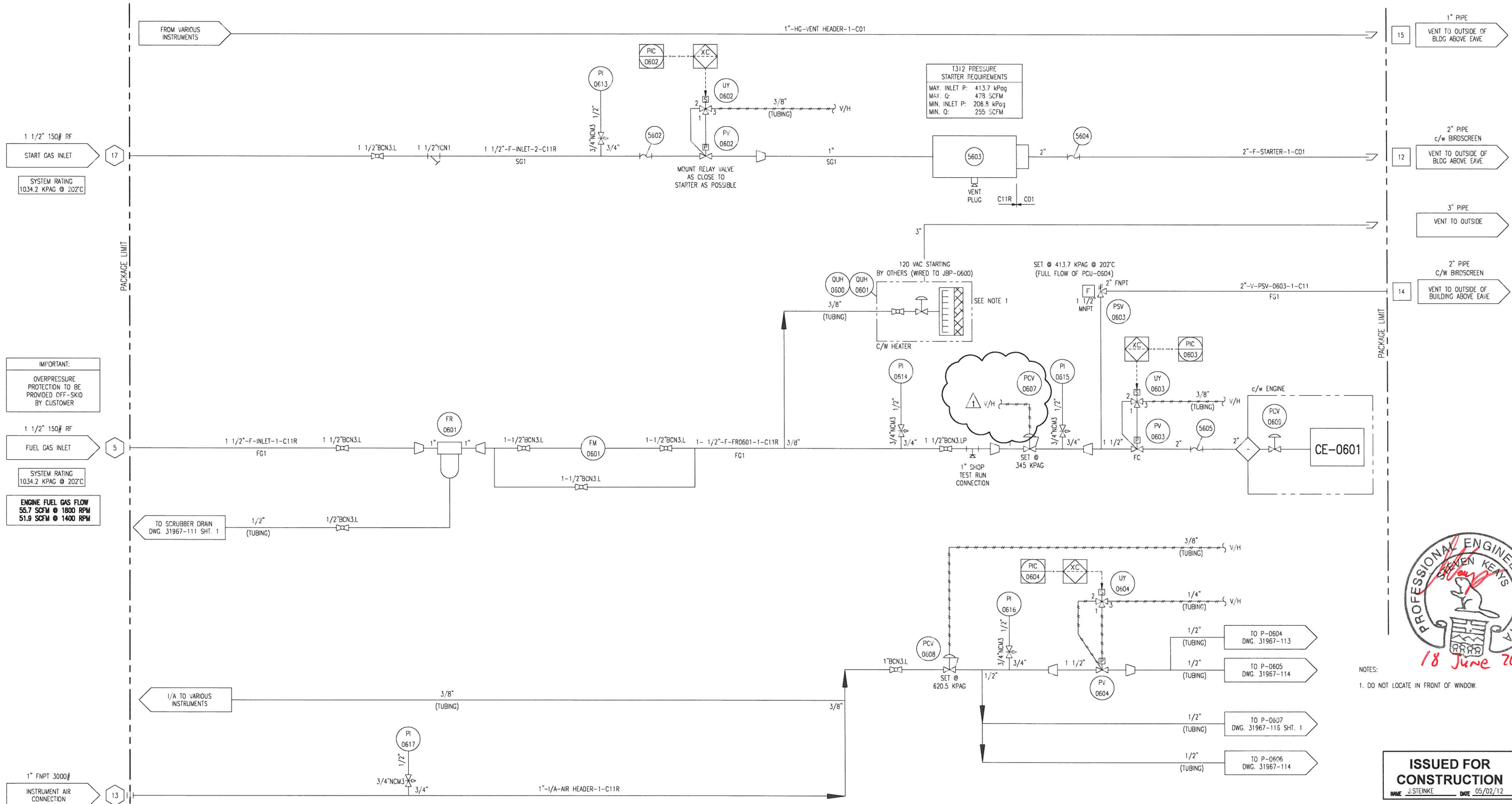
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**FR-0601
FUEL GAS FILTER**

MAKE: FINITE
MODEL: HN-45-10-CN
MAWP: 500 PSIG
1.0 MICRON

**QUH-0600/0601
BUILDING HEATER**

MAKE: CC1
MODEL: W2472
16 Blu/hr. 120 VAC
C/W GUARD AND HOOD



IMPORTANT:
OVERPRESSURE PROTECTION TO BE PROVIDED OFF-SKID BY CUSTOMER

1 1/2" 150# RF
SYSTEM RATING
1034.2 KPAG @ 202°C
ENGINE FUEL GAS FLOW
55.7 SCFM @ 1800 RPM
51.9 SCFM @ 1400 RPM

1" FNPT 3000#
INSTRUMENT AIR CONNECTION
RATED 1034.2 kPaq @ 65.6°C



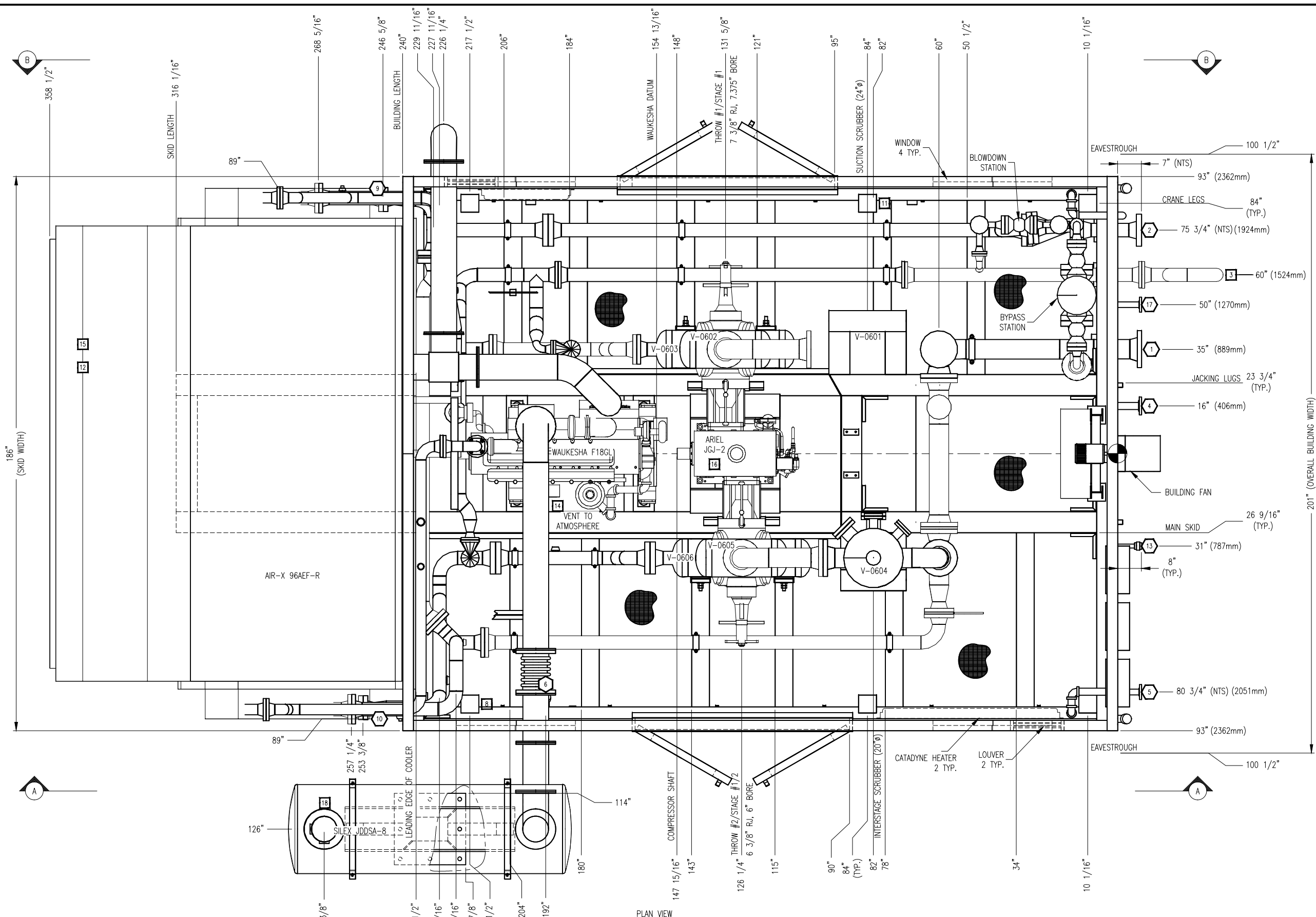
NOTES:
1. DO NOT LOCATE IN FRONT OF WINDOW.

ISSUED FOR CONSTRUCTION
DATE: J. STEINKE DME 05/02/12

				DATE	04/12/12	SCALE	NTS	HUSKY OIL OPERATIONS LTD. WAUKESHA F18GL ARIEL JGJ/2-1/2 STD		ENERFLEX Calgary, Alberta, Canada	P & I DIAGRAM START / FUEL GAS SUPPLY	SHT 1	REV 1
				DRAWN BY	J. STEINKE	CHECKED BY	J. LIN	APPROVED BY	S. PRITCHARD				
1	REVISED TO CUSTOMER MARK UPS	05/16/12	SE	J. LIN	PROJECT MANAGER		S. PRITCHARD	PROJECT ENGINEER		DWC 31967-115			
0	ISSUED FOR CONSTRUCTION	05/02/12	JMS	J. LIN	CUST PO					DWC 31967-114			
A	ISSUED FOR APPROVAL	04/16/12	JMS	J. LIN	APECCA PERMIT No:		P8651	STEP CODE		511 591	WORK ORDER		31967
REV	DESCRIPTION	DATE	BY	APR						DWC 31967-115			

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PLOT DATE Sep 10, 2012, J.Steinke C:\Users\J.Steinke\AppData\Local\Temp\McPublish_4288\31967-MODEL-AS-BUILD.dwg



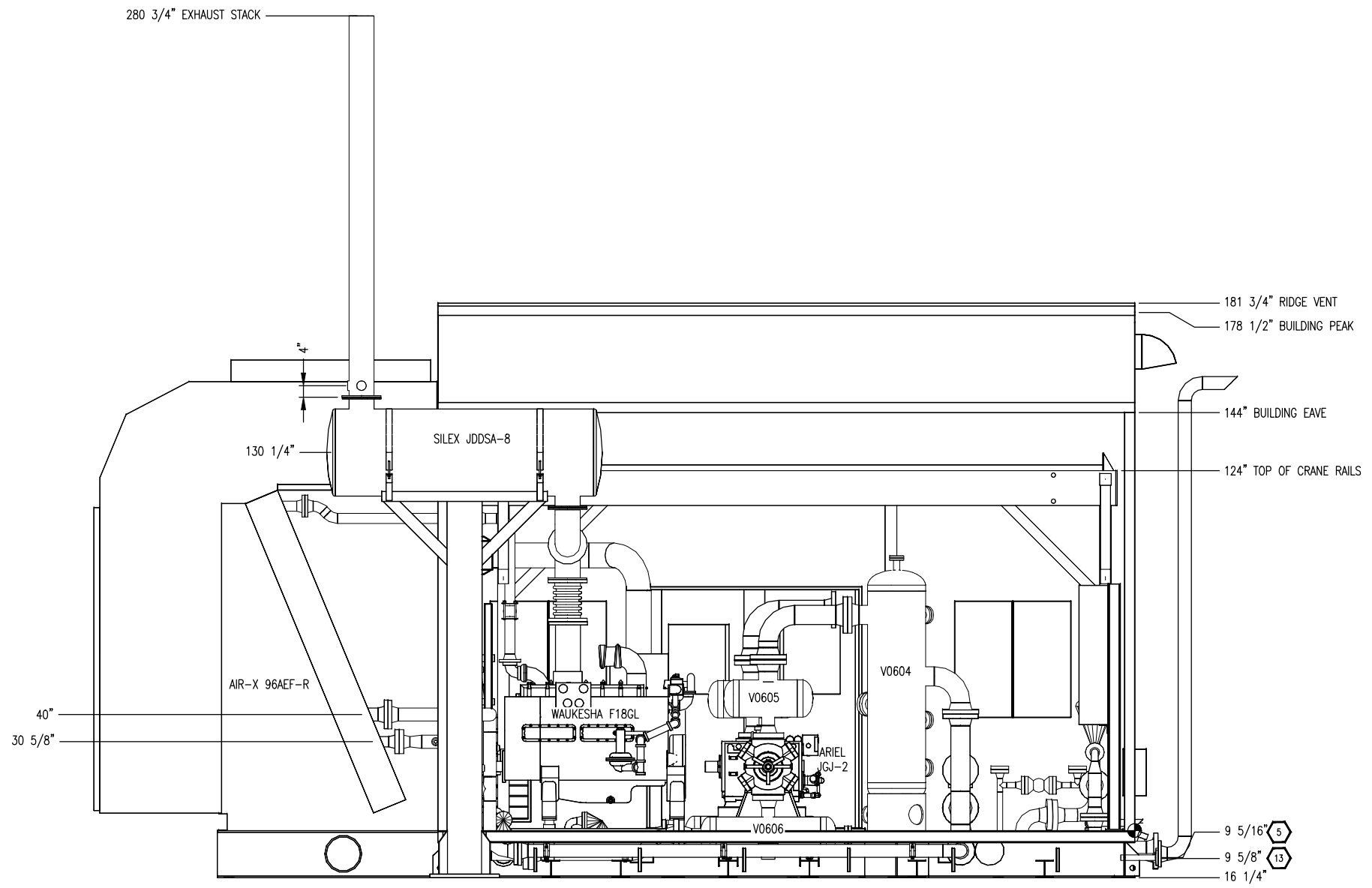
NOZZLE SCHEDULE				
MARK	SERVICE	SIZE	RATING	TYPE
1	AIR INLET	6"	300#	RF
2	FINAL DISCHARGE	4"	600#	RF
3	HIGH PRESSURE VENT HEADER (AIR)	4"	150#	RF
4	SCRUBBER DRAIN HEADER	2"	150#	RF
5	FUEL GAS INLET	1 1/2"	150#	RF
6	GLYCOL STAND PIPE	2"	3000#	MNPT
7	RECIP BYPASS OUTLET	4"	600#	RF
8	GLYCOL FILL	1"	3000#	FNPT
9	WASTE OIL DRAIN	2"	3000#	MNPT
10	WASTE GLYCOL DRAIN	2"	3000#	MNPT
11	ENGINE/COMP LUBE OIL FILL	3/4"	-	HOSE
12	STARTER VENT	2"	-	PIPE
13	INSTRUMENT AIR SUPPLY	1"	3000#	FNPT
14	HIGH PRESSURE VENT HEADER (GAS)	2"	-	-
15	LP INSTRUMENT VENT HEADER	1"	-	PIPE
16	COMPRESSOR OIL FILL	2"	-	MNPT
17	START GAS INLET	1 1/2"	150#	RF
18	EXHAUST	8"	12GA	TUBE

GENERAL SPECIFICATIONS		
OVERALL PACKAGE LENGTH		31'-9 1/8"
OVERALL PACKAGE WIDTH		16'-9"
OVERALL PACKAGE HEIGHT (#/STACK)		24'-9"
OVERALL OPERATING PACKAGE WEIGHT (LBS)		75500
MAIN SKID SHIPPING WEIGHT (LBS)		74300
BRIDGE CRANE RATING		3 TON
SEAL PAN	<input checked="" type="checkbox"/> FLAT <input type="checkbox"/> NONE <input type="checkbox"/> SLOPED	
LOADING METHOD	<input type="checkbox"/> LIVE ROLL <input type="checkbox"/> CRANE <input checked="" type="checkbox"/> JACK & ROLL	
NOTES:		
1. ALL (2) DIMENSIONS TAKEN FROM TOP OF SKID.		
2. ALL OTHER NOTES FOUND ON DWG. #LEGEND.		
3. ALL SKID EDGE CONNECTIONS ±1/4" TOLERANCE.		
4. ALL TAIL DIMENSIONS FROM REFERENCE POINT.		
5. SKID DEPTH:		
6. CENTER OF GRAVITY:		
X' FROM REF. POINT: 164.287		
Y' FROM REF. POINT: 0.839		
Z' FROM REF. POINT: 30.798		

FINAL AS BUILT
NAME J.STEINKE DATE 09/10/12

REV	DESCRIPTION	DATE	BY	APR	DATE	SCALE	SCALE	PROJECT	DWG NO	SHT	REV
3	FINAL AS-BUILT	09/10/12	JMS	A.Z.	04/16/12	3/4"=1'-0"		HUSKY OIL OPERATIONS LTD.	31967-201	1	3
2	ADDED SAMPLE POINTS TO EXHAUST STACK	07/04/12	CE	J.LIN				Waukesha F18GL			
1	DIM ADDED TO LOCATE MUFFLER STAND	05/08/12	JMS	J.D.				Ariel JGJ/2-1/2 STD			
0	ISSUED FOR CONSTRUCTION	05/02/12	JMS	J.LIN							
A	ISSUED FOR APPROVAL	04/24/12	JMS	J.P.							

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ELEVATION VIEW A-A

FINAL AS BUILT
 NAME J.STEINKE DATE 09/10/12

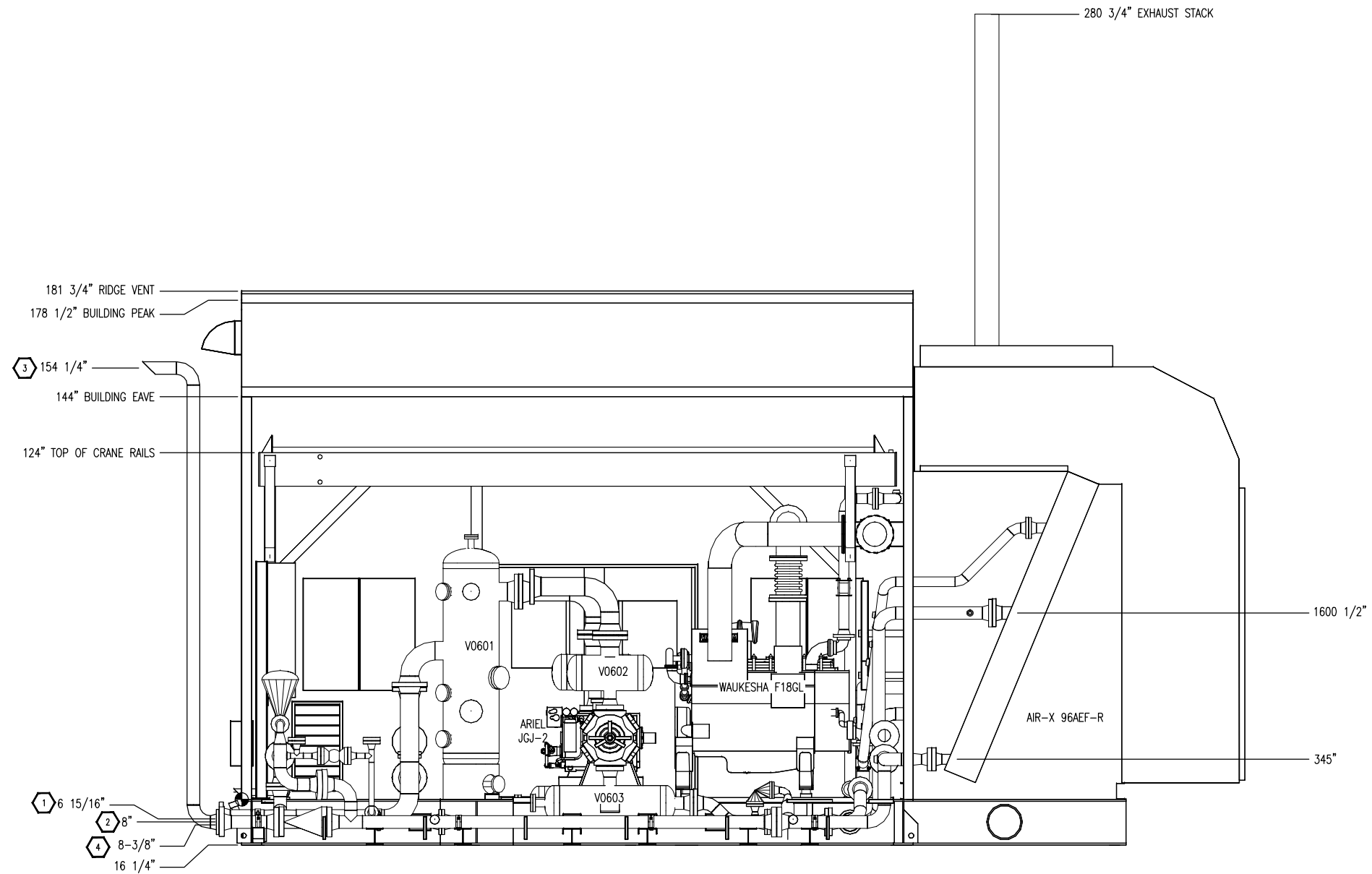
NOTE:
 ALL TAIL DIMENSIONS ARE
 TAKEN FROM REFERENCE
 POINT AT TOP OF SKID

				DATE 04/16/12	SCALE 1/2"=1'-0"	HUSKY OIL OPERATIONS LTD.		ENERFLEX Calgary, Alberta, Canada	ELEVATION 'A-A'	
				DRAWN BY J.STEINKE	CHECKED BY J.P.	APPROVED BY S.PRITCHARD				
				PROJECT MANAGER S.PRITCHARD	PROJECT ENGINEER J.LIN		Waukesha F18GL			
				CUST PO N/A			ARIEL JGJ/2-1/2 STD			
				APEGGA PERMIT No: P8651	STEP CODE 198/298/490/511/591	WORK ORDER 31967	DWG NO 31967-201		SHT 2	REV 2
REV	DESCRIPTION	DATE	BY	APR						
2	FINAL AS-BUILT	09/10/12	JMS	A.Z.						
1	ADDED SAMPLE POINTS TO EXHAUST STACK	07/04/12	CE	J.LIN						
0	ISSUED FOR CONSTRUCTION	05/02/12	JMS	J.LIN						
A	ISSUED FOR APPROVAL	04/24/12	JMS	J.P.						

PLOT DATE Sep 10, 2012, J.Steinke C:\Users\j.steinke\AppData\Local\Temp\AcPublish_4288\31967-MODEL-AS BUILT.dwg

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ELEVATION VIEW B-B

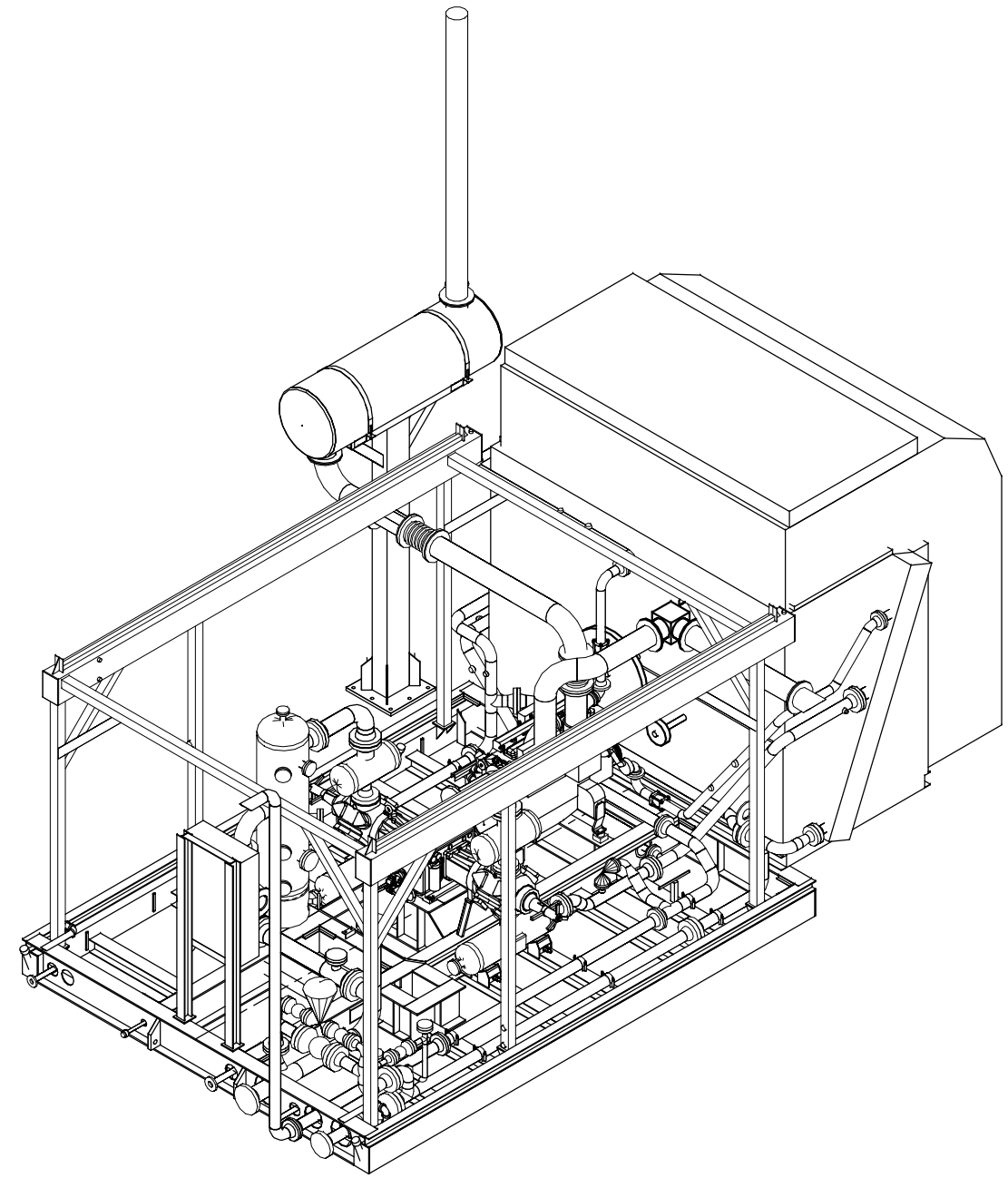
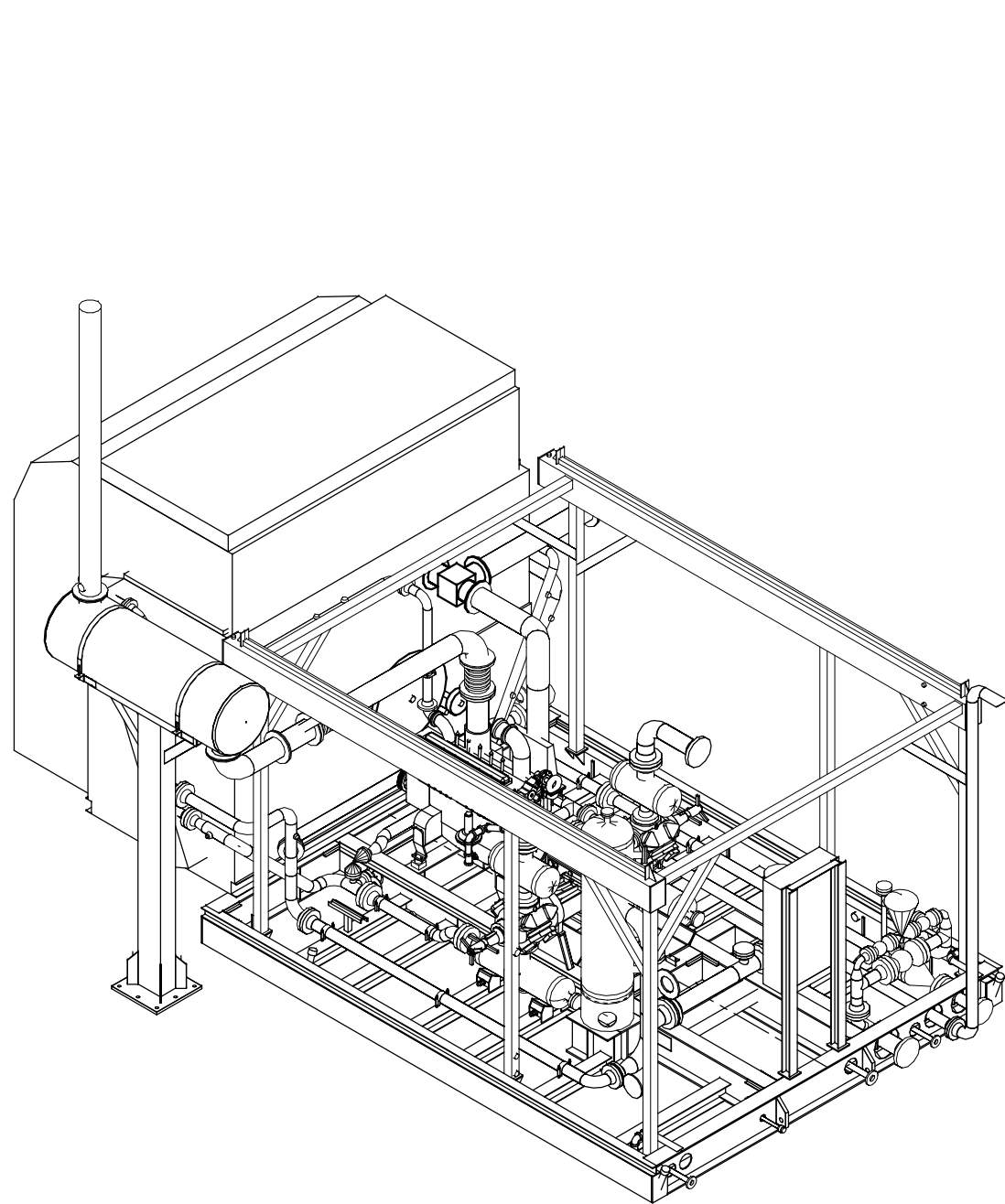
FINAL AS BUILT
 NAME J.STEINKE DATE 09/10/12

NOTE:
 ALL TAIL DIMENSIONS ARE
 TAKEN FROM REFERENCE
 POINT AT TOP OF SKID

				DATE 04/16/12	SCALE 1/2"=1'-0"	HUSKY OIL OPERATIONS LTD. WAUKESHA F18GL ARIEL JGJ/2-1/2 STD	ENERFLEX Calgary, Alberta, Canada	ELEVATION 'B-B'		
				DRAWN BY J.STEINKE	CHECKED BY J.P.			APPROVED BY S.PRITCHARD		
				PROJECT MANAGER S.PRITCHARD	PROJECT ENGINEER J.LIN					
1	FINAL AS-BUILT	09/10/12	JMS	A.Z.	CUST PO N/A		DWG NO 31967-201	SHT 3	REV 1	
0	ISSUED FOR CONSTRUCTION	05/02/12	JMS	J.LIN	APEGGA PERMIT No: P8651					
A	ISSUED FOR APPROVAL	04/24/12	JMS	J.P.	STEP CODE 198/238/490/511/581	WORK ORDER 31967				
REV	DESCRIPTION	DATE	BY	APR						

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PLOT DATE Sep 10, 2012, J.Steinke C:\Users\J.Steinke\AppData\Local\Temp\AcPublish_4298\11967-MODEL-AS-BUILT.dwg



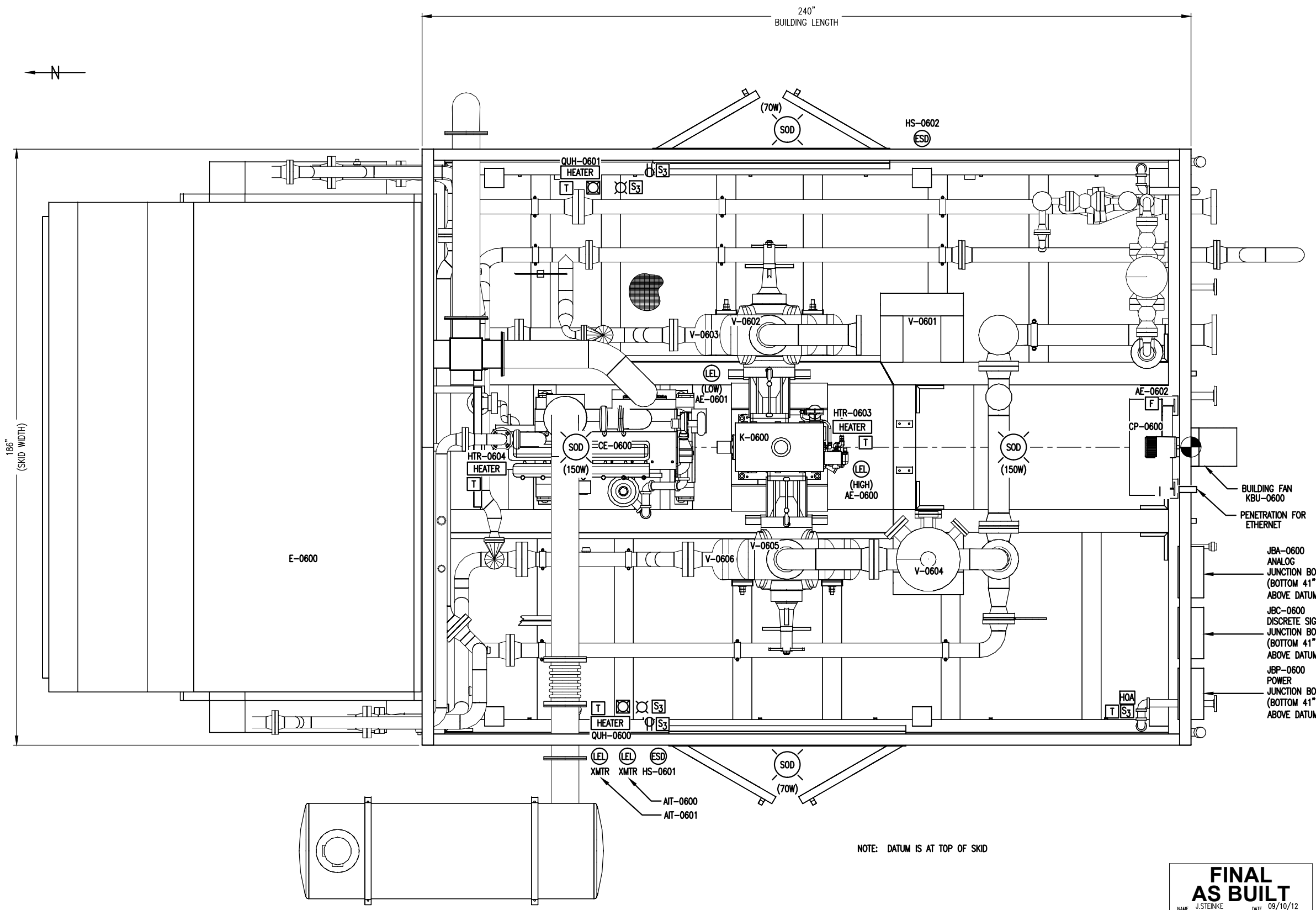
3D VIEW

FINAL AS BUILT
 NAME J.STEINKE DATE 09/10/12

				DATE 04/16/12	SCALE 3/8"=1'-0"	HUSKY OIL OPERATIONS LTD.		ENERFLEX Calgary, Alberta, Canada	3D VIEW
				DRAWN BY J.STEINKE	CHECKED BY J.P.	APPROVED BY S.PRITCHARD	WAUKESHA F18GL		
				PROJECT MANAGER S.PRITCHARD	PROJECT ENGINEER J.LIN		ARIEL JGJ/2-1/2 STD		
				CUST PO	N/A				
				APEGGA PERMIT No: P8651	STEP CODE 198/298/490/511/591	WORK ORDER 31967	DWG NO 31967-201	SHT 4	REV 1
REV	DESCRIPTION	DATE	BY	APR					
1	FINAL AS-BUILT	09/10/12	JMS	A.Z.					
0	ISSUED FOR CONSTRUCTION	05/02/12	JMS	J.LIN					
A	ISSUED FOR APPROVAL	04/24/12	JMS	J.P.					

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C:\Users\j.steinke\AppData\Local\Temp\Ketchubak_4288\11967-MKBL-AS-BUILD.dwg
 P:\UI\MAIL Sep 10, 2012, j.steinke



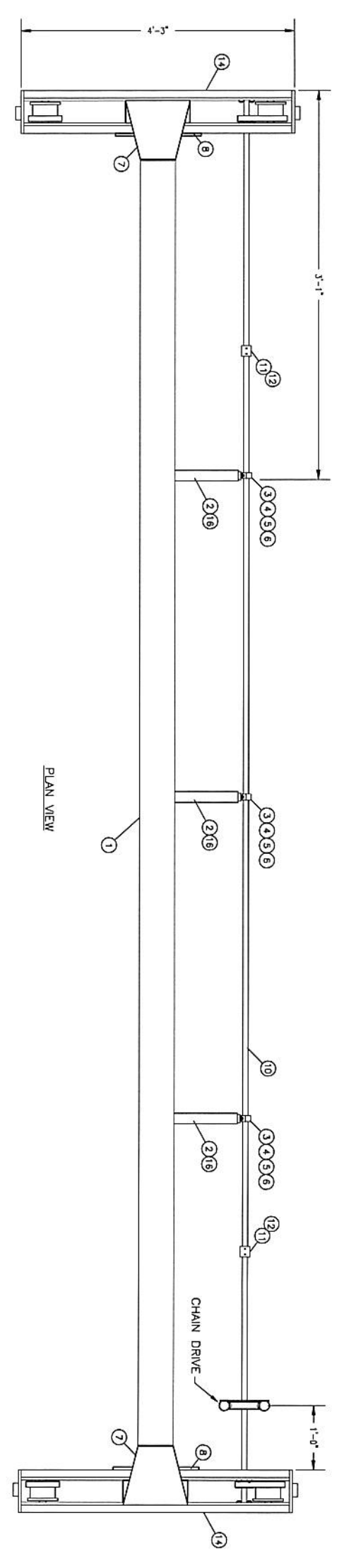
ELECTRICAL LEGEND	
SYMBOL	DESCRIPTION
	LIGHT
	INCANDESCENT LIGHT
	H.P. SODIUM LIGHT
	BATTERY POWERED EMERGENCY LIGHT
	RECEPTACLE
	THERMOSTAT
	FIRE EYE
	FIRE PULL STATION
	COMBUSTIBLE LEL GAS ALARM BEACON
	TOXIC GAS H2S ALARM BEACON
	FIRE ALARM STROBE
	ALARM HORN
	CO SENSOR
	COMBUSTIBLE DETECTION
	H2S SENSOR
	HEATER
	TIMER SWITCH
	EMERGENCY SHUT DOWN BUTTON
	3-WAY SWITCH
	-
	-
	-
	-

FINAL AS BUILT
 NAME: J.STEINKE DATE: 09/10/12

PLAN VIEW

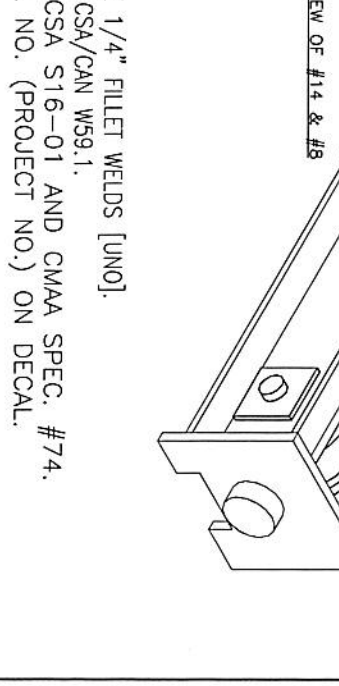
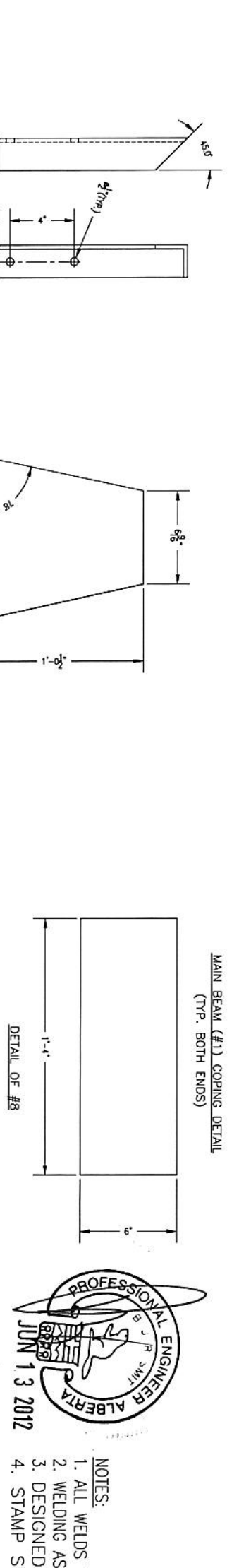
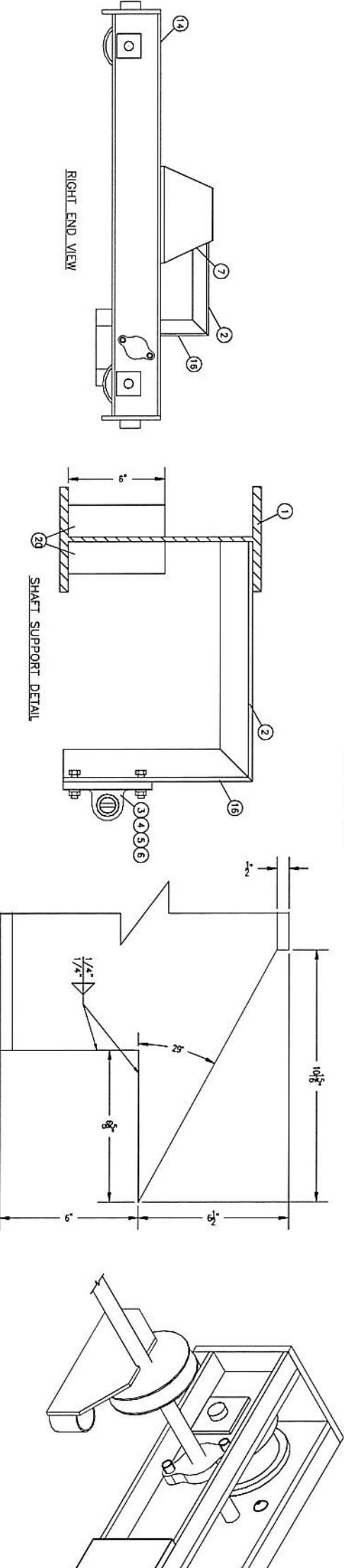
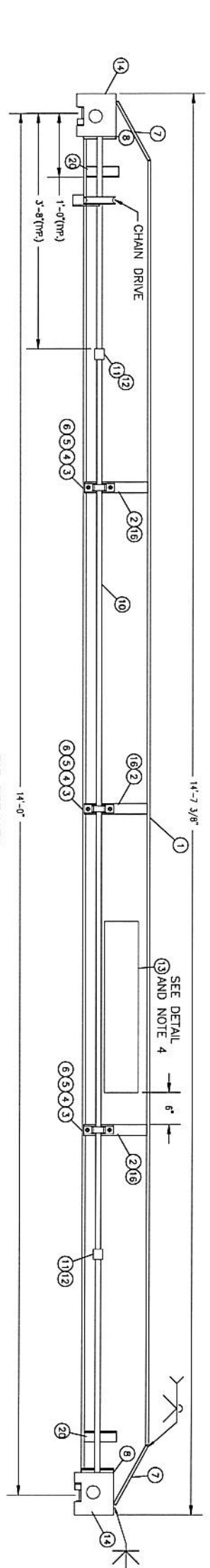
				DATE: 04/16/12	SCALE: 3/4"=1'-0"	HUSKY OIL OPERATIONS LTD. WAUKESHA F18GL ARIEL JGJ/2-1/2 STD	ENERFLEX Calgary, Alberta, Canada	ELECTRICAL LAYOUT	
DRAWN BY: J.STEINKE		CHECKED BY: J.LIN		APPROVED BY: S.PRITCHARD					
PROJECT MANAGER: S.PRITCHARD		PROJECT ENGINEER: J.LIN		CUST PO: N/A					
REV		DESCRIPTION	DATE	BY	APR				

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BILL OF MATERIAL

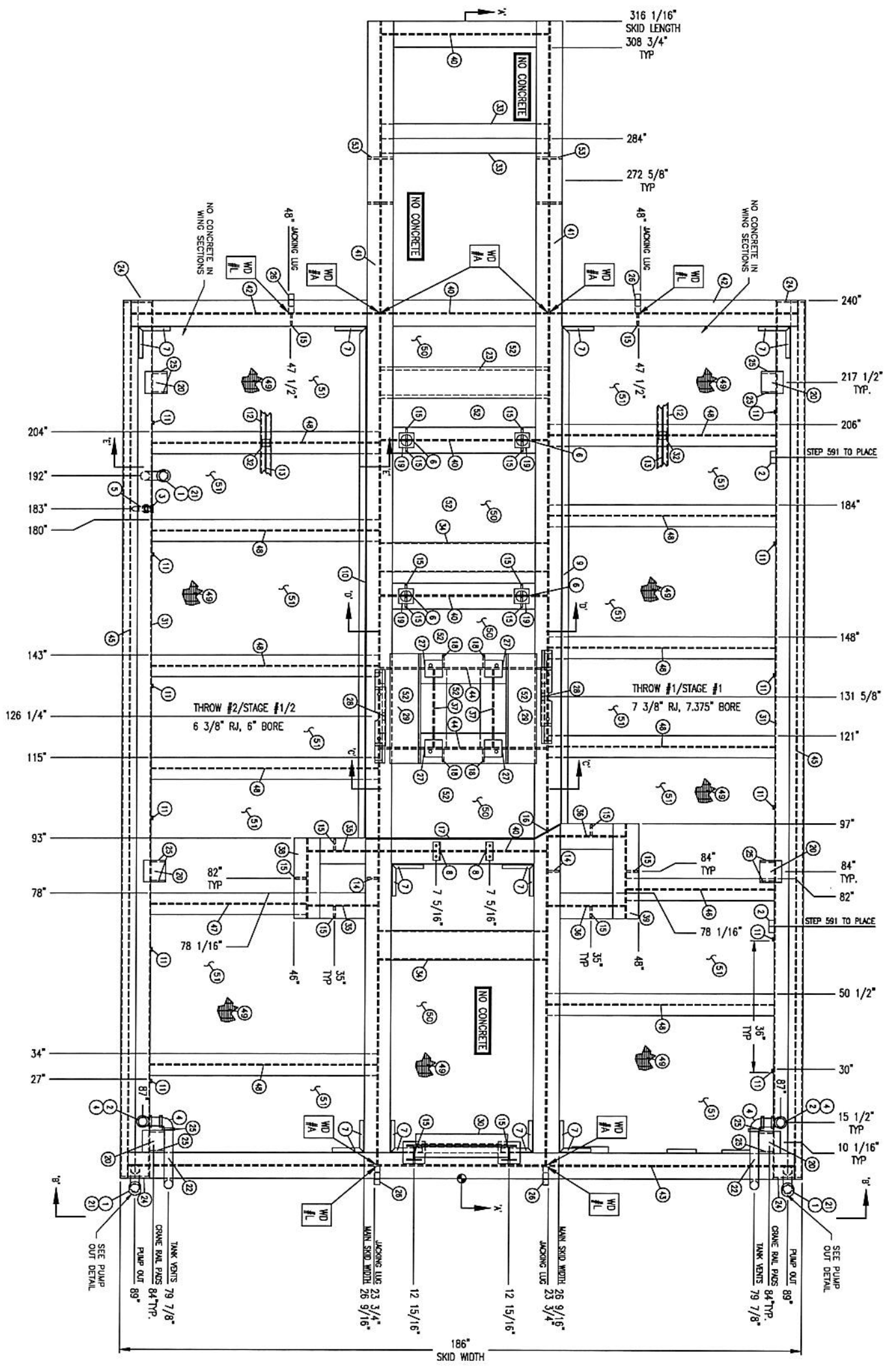
MARK	PART NUMBER	QTY	LONG ANNOTATION	MATERIAL	LENGTH
1	004-HR-120-0030	1	WRE FLANGE 12" X 3/4"	Q40214W	14'-3 9/16"
2	005-HR-0200-0200-0025	6	ANGLE 2" X 2" 1/4" THK	Q40214W	1'-2 7/8"
3	000G-102205-15	3	PULLEY BLOCK 1000LB	-	-
4	402-1022-0037	6	LOCK WASER 3/8" STD. PLTD.	-	-
5	403-4025-0037	6	3/8" NUT, HEX HEAD, W. CR. 8	-	-
6	401-40220-0037-0125	6	3/8" BOLT, W. CR. 8	Q40214W	1 1/4"
7	010-HR-1200-0030	2	FLANGE 12" X 1/2" THK	Q40214W	1'-0 1/2"
8	040-HR-0050	2	PLATE 1/2" SMOOTH X 1'-4" X 6"	Q40214W	-
9	-	-	-	-	-
10	012-HR-0100	1	ROUND BAR 1"	Q40214W	11'-0 1/2"
11	121-HR-0100	2	3/4" - 3000] SCHED CORNPLNG (DRILLED OUT TO 1")	SA-105-N	-
12	NRN	4	SPRNG PH-SLQTRD. 1/4" DIA	-	1 1/4"
13	DECK-DR-3 TONNE CRANE	2	BERTERLS 3-TONNE/2 1/2 X 6, 2008 CRANE (1 RIB SHD)	-	-
14	TES-HHR-DRTRUCKS-3-TONNE	1	DRTRUCKS, SET OF 2, 3 TONNE RATED	-	-
15	010V-74195	1	PAINT - NEW OIL YELLOW	-	4 LITERS
16	005-HR-0200-0200-0025	6	ANGLE 2" X 2" 1/4" THK	Q40214W	11 11/16"
17	TES-HHR-HKDTI-5-TONNE	1	PROLLETY CHAIN DRIVE, 5-TONNE	-	-
18	TES-HHR-HBTI-5-TONNE	1	HOSI CHAIN, 7' DRPG, 3 TONNE RATED	-	-
19	-	-	-	-	-
20	005-HR-0200-0200-0025	4	ANGLE RBN, 2" X 2" X 1/4"	Q40214W	6"



- NOTES:**
1. ALL WELDS TO BE 1/4" FILLET WELDS [UNO].
 2. WELDING AS PER CSA/CAN W59.1.
 3. DESIGNED TO CSA S16-01 AND CMAA SPEC. #74.
 4. STAMP SERIAL NO. (PROJECT NO.) ON DECAL.



ENERFLEX BRIDGE CRANE ASSEMBLY 3 TONNE CAPACITY		MANUFACTURED BY ENERFLEX 3 TONNE CAPACITY SERIAL NO. _____	
ISSUED FOR CONSTRUCTION DESCRIPTION DATE BY PPR		DATE 04/24/12 SCALE 1/2" = 1'-0"	
DRAWN BY J. STEINKE PROJECT MANAGER S. PRICHARD		CHECKED BY J.D. PROJECT ENGINEER J.LIN	
HUSKY OIL OPERATIONS LTD. WAUKESHA, WI 53186 ARIEL JGA/2-1/2 STD		ORDER NO. N/A	
WORK ORDER 31967		SHEET 1	
REV 1		REV 1	



PLAN VIEW

IMPORTANT NOTICE TO OWNER/OPERATOR

THE DESIGN OF THE FOUNDATION FOR THIS COMPRESSOR PACKAGE IS NOT IN THE SCOPE OF SUPPLY BY ENERFLEX LTD. (ENRFX), AS SUCH, THE DESIGN AND QUALITY OF THE FOUNDATION IS ENTIRELY THE RESPONSIBILITY OF THE OWNER/OPERATOR AND/OR ITS ENGINEERING FIRM AND THEIR REPRESENTATIVES. REFER TO TEST Dwg. NO. 31967-351, SHEET 1 FOR FURTHER INFORMATION, AND OWNER/OPERATORS OBLIGATIONS AND LEGAL LIMITATIONS.

NOTES

1. PROVIDE ALL ROUGH EGGS & WELD SPATTERS.
2. SANDBLAST INTERIORS OF GALV. STORAGE TANK PRIOR TO FINAL ASSEMBLY.
3. AIR PRESSURE TEST GALV. & OIL TANKS TO 10 PSI.
4. CONSTRUCT STRUCTURE FLUSH TO TOP UNLESS OTHERWISE NOTED.
5. ALL TAIL DIMENSIONS FROM REFERENCE POINT.
6. WEIGHT OF SKID (W/O CONCRETE) 10,500 LBS.
7. 1/4" IN LENGTH HAS BEEN REMOVED FROM TIEBARS #40 & #44 FOR FIT UP.
8. SEAL P/W IS FLAT.
9. FRAMES 175-59-001, FN-1, RED COLORED.
10. ALL WELDS TO BE 1/4" MIN. THICKNESS ALL WELDS, UNLESS OTHERWISE NOTED.
11. SEE SHEET 31967-300, SHEET 1 FOR WELD DETAILS.

REV	DESCRIPTION	DATE	BY	APP	DATE	BY	APP	SCALE	DATE	BY	APP
1	ISSUED FOR CONSTRUCTION	04/20/12	JMS	JD	04/18/12	JMS	JLIN	3/4" = 1'-0"	04/17/12	JMS	JD
A	ISSUED FOR APPROVAL										

ENERFLEX
Calgary, Alberta,
Canada

31967-301

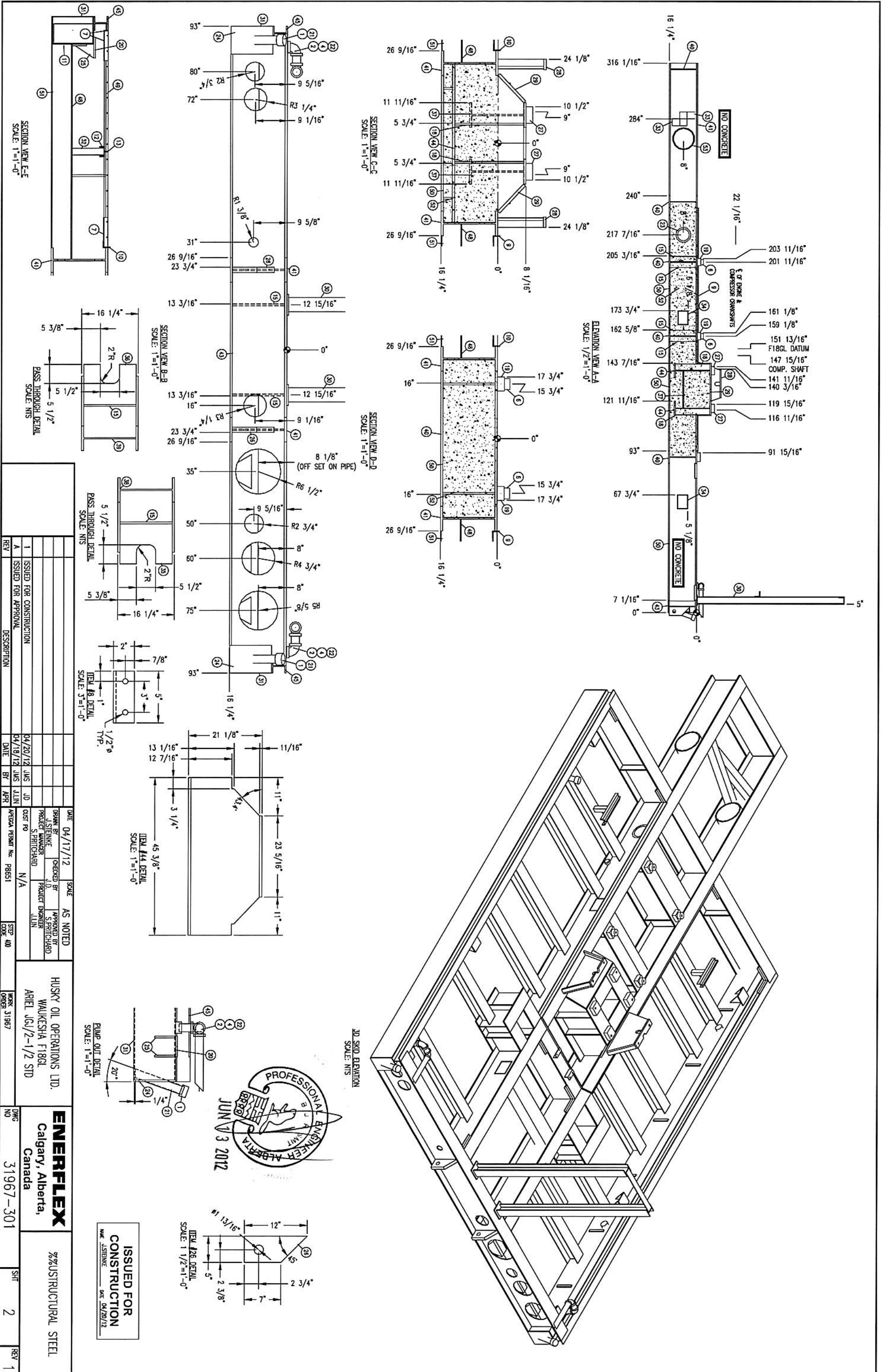
STRUCTURAL STEEL



ISSUED FOR CONSTRUCTION
DATE: 04/20/12

BILL OF MATERIAL

NO	DESCRIPTION	UNIT	LENGTH	PART NUMBER
1	PIPE 2" X 1/8" THK	54-105	115-188-0200	
2	PIPE 2" X 1/8" THK	54-105	123-188-0200	
3	PIPE 2" X 1/8" THK	54-105	142-188-0100	
4	PIPE 2" X 1/8" THK	54-105	148-188-0200	
5	PIPE 2" X 1/8" THK	54-105	800-188-0100	
6	ANGLE 1-1/2" X 1-1/2" X 1/8" THK	602144W	906-14-0125-0125-0018	
7	ANGLE 2" X 2" X 1/8" THK	602144W	906-14-0200-0200-0025	
8	ANGLE 2" X 2" X 1/8" THK	602144W	135-15/16-005-14-0200-0200-0025	
9	ANGLE 2" X 2" X 1/8" THK	602144W	135-15/16-005-14-0200-0200-0025	
10	ANGLE 2" X 2" X 1/8" THK	602144W	135-15/16-005-14-0200-0200-0025	
11	CHANNEL 1" X 0.315"	602144W	018-14-0100-0008	
12	CHANNEL 1" X 0.315"	602144W	225-7/8-018-14-0100-0041	
13	PLATE BAR 1" X 1/2" THK	602144W	018-14-0300-0059	
14	PLATE BAR 1" X 1/2" THK	602144W	018-14-0300-0059	
15	PLATE BAR 1" X 1/2" THK	602144W	018-14-0300-0059	
16	PLATE BAR 1" X 1/2" THK	602144W	018-14-0300-0059	
17	PLATE BAR 1" X 1/2" THK	602144W	018-14-0300-0059	
18	PLATE BAR 1" X 1/2" THK	602144W	018-14-0300-0059	
19	PLATE BAR 1" X 1/2" THK	602144W	018-14-0300-0059	
20	PLATE BAR 1" X 1/2" THK	602144W	018-14-0300-0059	
21	PIPE 2" X 1/8" THK	54-105	802-188-0200	
22	PIPE 2" X 1/8" THK	54-105	802-188-0200	
23	PIPE 2" X 1/8" THK	54-105	800-188-0200	
24	PIPE 2" X 1/8" THK	54-105	800-188-0200	
25	PIPE 2" X 1/8" THK	54-105	800-188-0200	
26	PLATE 1/2" X 3/16" X 3/16" (SEE Dwg. LFT LUG REV)	602144W	7-3/16-040-14-0150	
27	PLATE 1/2" X 3/16" X 3/16" (SEE Dwg. LFT LUG REV)	602144W	12-040-14-0150	
28	CLAMP SUPPORT, SEE Dwg. (ALL CLAMP SUPPORT)	602144W	N/A	
29	PANEL 5/8" X 1/4" THK	602144W	940-14-0075	
30	PANEL 5/8" X 1/4" THK	602144W	N/A	
31	PANEL 5/8" X 1/4" THK	602144W	N/A	
32	TUBING 2" X 1/8" THK	6021350W	020-14-0200-0200-0018	
33	TUBING 2" X 1/8" THK	6021350W	020-14-0200-0200-0018	
34	TUBING 2" X 1/8" THK	6021350W	020-14-0200-0200-0018	
35	WIDE FLANGE 16" X 50#	602150W	034-14-1600-0030	
36	WIDE FLANGE 16" X 50#	602150W	034-14-1600-0030	
37	WIDE FLANGE 16" X 50#	602150W	034-14-1600-0030	
38	WIDE FLANGE 16" X 50#	602150W	034-14-1600-0030	
39	WIDE FLANGE 16" X 50#	602150W	034-14-1600-0030	
40	WIDE FLANGE 16" X 50#	602150W	034-14-1600-0030	
41	WIDE FLANGE 16" X 50#	602150W	034-14-1600-0030	
42	WIDE FLANGE 16" X 50#	602150W	034-14-1600-0030	
43	WIDE FLANGE 16" X 50#	602150W	034-14-1600-0030	
44	WIDE FLANGE 16" X 50#	602150W	034-14-1600-0030	
45	WIDE FLANGE 16" X 50#	602150W	034-14-1600-0030	
46	WIDE FLANGE 16" X 50#	602150W	034-14-1600-0030	
47	WIDE FLANGE 16" X 50#	602150W	034-14-1600-0030	
48	WIDE FLANGE 16" X 50#	602150W	034-14-1600-0030	
49	WIDE FLANGE 16" X 50#	602150W	034-14-1600-0030	
50	PLATE 1/2" X 3/16" (SEE Dwg. LFT LUG REV)	602144W	044-14-0012	
51	PLATE 1/2" X 3/16" (SEE Dwg. LFT LUG REV)	602144W	044-14-0012	
52	CONCRETE, MAX 2800 PSI, 20 MPa, STRENGTH C/M, MAX 2302 KG/M ³ (142.5 LB/FT ³) (ALL CONCRETE SECTION A-A FOR CONDITIONS)	21	CONCRETE-2800PSI-M-350	
53	PRE-CAST CONCRETE	54-104-B	902-188-1200	



REV	DESCRIPTION	DATE	BY	APPR	SCALE
1	ISSUED FOR CONSTRUCTION	04/20/12	JMS	JD	AS NOTED
A	ISSUED FOR APPROVAL	04/19/12	JMS	JLN	AS NOTED

ENERFLEX
 Calgary, Alberta,
 Canada

HUSKY OIL OPERATIONS LTD.
 WAUKESHA FT8GL
 AREL JGJ/2-1/2 STD

DWG NO: 31967-301
 SHEET: 2
 REV: 1

ISSUED FOR CONSTRUCTION
 DATE: 04/20/12
 DATE: 04/20/12

PROFESSIONAL ENGINEER
 JUN 3 2012

NOTES:

- EXTERIOR WALLS TO BE: 22GA TAN QC8315
- EXTERIOR ROOF TO BE: 22GA TAN QC8315
- EXTERIOR TRIM TO BE: 22GA METRO BROWN QC8228
- DOORS TO BE PAINTED: METRO BROWN QC8228
- INTERIOR LINER TO BE: 20GA 10% PERFORATED WHITE ALUM. OVER 3', 24GA WHITE ALUM BELOW
- INSULATION IN WALLS: R-12 FIBERGLASS BATT
- INSULATION IN ROOF: R-20 FIBERGLASS BATT
- VAPOUR BARRIER TO BE: 6 MIL

SURFACE AREA =	1219 SQR/FT.
APROX. TOTAL SHIPPING WEIGHT =	5200Lbs. BUILDING ONLY

- 2 - 18" x 32" MANUALLY OPERABLE LOUVERS c/w BIRD SCREENS
- 1 - 16" VENTURI XP. WALL MOUNTED EXHAUST FAN 115/230v, 1ph, 60hz, 1/4hp (36 ACPH) CLASS 1, DIV 1, GROUP C&D c/w BACKDRAFTDAMPER & WEATHER HOOD(TO BE INSTALLED)
- 2 - DOUBLE DOOR CANOPIES (SHIP LOOSE)
- CLIMASEAL FASTENERS THROUGHOUT
- P.ENG. STAMPED BUILDING DWGS. REQ'D. (ALBERTA REGISTERED)

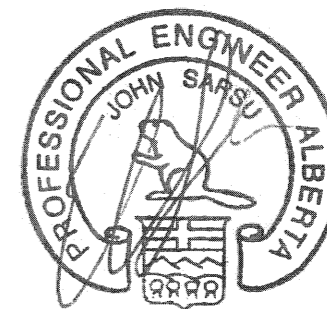
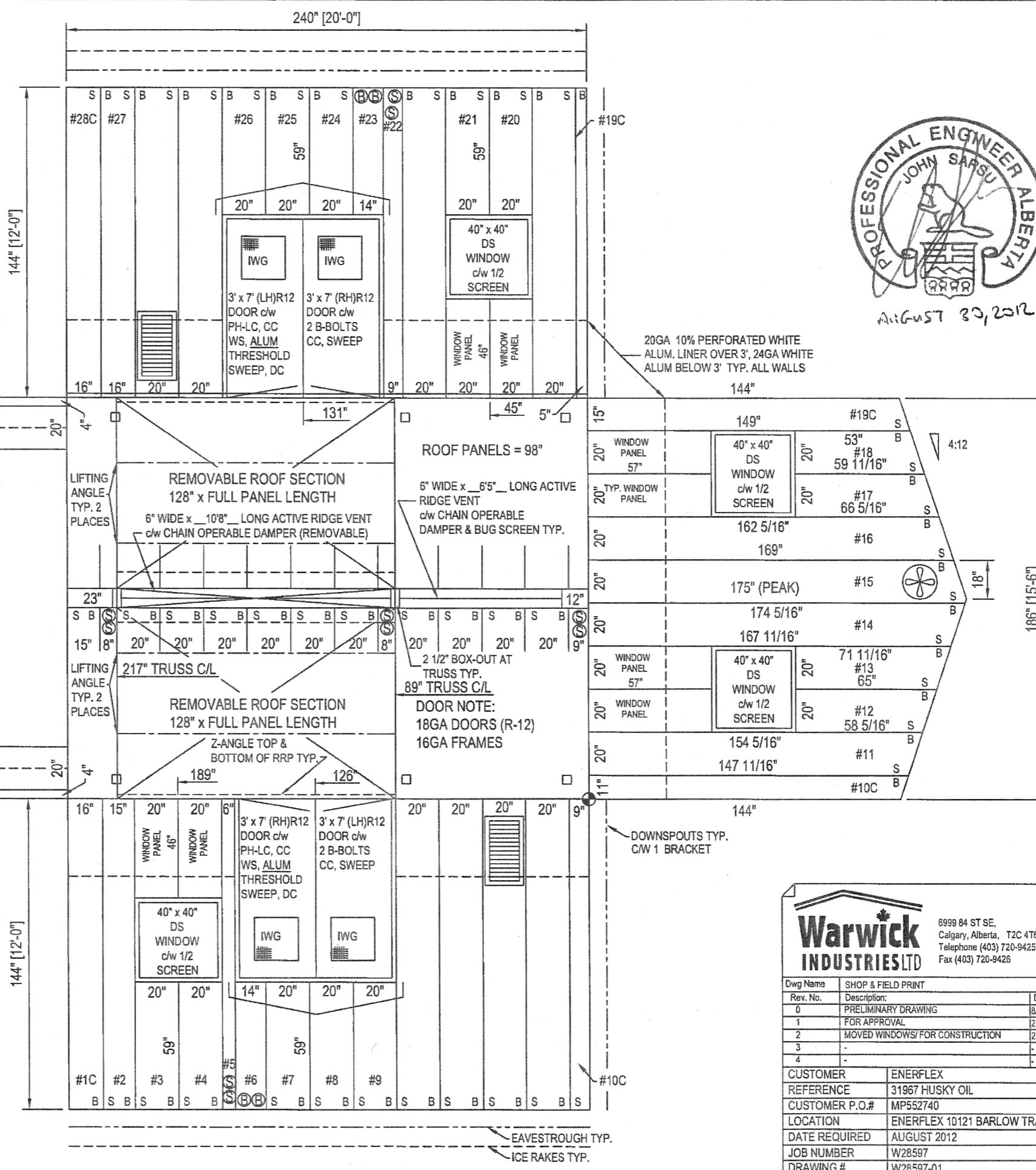
- DESIGN LOADS: SLAVE LAKE AREA
- 1/50 SNOW = 1.9kPa
- 1/50 WIND = 0.37kPa

- APX. OVERALL BLDG. DIMENSIONS:
- WIDTH = 201"
- HEIGHT = 181" PLUS SKID

- NOTE:**
- ALL DIMENSIONS ARE IN INCHES AND DECIMAL INCHES.
 - DO NOT SCALE DRAWINGS.
 - ALL DIMENSIONS TO WINDOWS AND DOORS ARE TO ROUGH OPENINGS.
 - CONFIRM LOCATION OF ANY LOUVERS AND OR FANS PRIOR TO INSTALLATION
 - CENTER BUILDING ON SKID
 - BUILDING INSTALLATION & ASSEMBLY SHALL BE AS PER WARWICK INSTALLATION MANUAL, AND DETAILS. WHERE THERE ARE CONFLICTS INFORMATION ON DRAWINGS SHALL BE TAKEN AS CORRECT

LEGEND	
DS = DOUBLE GLAZED	CC = CHECK CHAIN
IWG = INDUSTRIAL WIRE GLASS	WS = WEATHERSTRIPPING
RH = RIGHT HAND SWING	DC = HYDRAULIC CLOSURE
LH = LEFT HAND SWING	SG = INTERIOR SLIDE GATE
PH = PANIC HARDWARE	GA = GAUGE
LC = LOCK CYLINDER	INS = INSULATED
R-12 = CORE INSULATION (R-12)	LS = LOCK SET

NOTES:
BUILDING IS DESIGNED TO COMPLY WITH N.B.C. 2005 AS PER THE WIND AND SNOW LOAD SPECIFIED ON THE DRAWING. OWNER SHALL CONTACT WARWICK INDUSTRIES, IF ACTUAL BUILDING LOCATION DIFFERS FROM THOSE SHOWN, IN ORDER TO VALIDATE THE STABILITY OF THE DESIGN FOR THE INTENDED LOCATION.



August 30, 2012



6999 84 ST SE,
Calgary, Alberta, T2C 4T8
Telephone (403) 720-9425,
Fax (403) 720-9426

Dwg Name	SHOP & FIELD PRINT	Date:	Drawn By:	Checked By:
0	PRELIMINARY DRAWING	8/6/2010	AD	AD
1	FOR APPROVAL	27/11/2012	AD	AD
2	MOVED WINDOWS/ FOR CONSTRUCTION	27/11/2012	AD	AD
3	-	-	-	-
4	-	-	-	-

CUSTOMER	ENERFLEX
REFERENCE	31967 HUSKY OIL
CUSTOMER P.O.#	MP552740
LOCATION	ENERFLEX 10121 BARLOW TRAIL NE
DATE REQUIRED	AUGUST 2012
JOB NUMBER	W28597
DRAWING #	W28597-01